HP-179A

US, Canadian and E Model

STEREO MUSIC SYSTEM

SPECIFICATIONS

Fm Tuner Section

Frequency range:	87.5 MHz ~ 108 MHz
Usable sensitivity:	2.2 μV (S/N = 30 dB)
Signal-to-noise ratio:	65 dB
Capture ratio:	4 dB
Frequency response:	20 Hz ~ 15 kHz (± 3 dB)
Fm stereo separation:	Greater than 30 dB at 400 Hz

A-m Tuner Section

Frequency range:	530 kHz ~ 1,605 kHz
Sensitivity:	48 dB/m, built-in antenna 20 μV, external antenna
Signal-to-noise ratio:	50 dB

Audio Amplifier Section

Music power output (EIA 5 %):	10 watts total (8 ohms)
Continuous power output (IHF 5 %): (rated output)	3 watts + 3 watts (8 ohms)
Harmonic distortion:	Less than 5.0 % at 1 kHz at rated output Less than 0.5 % at 1 kHz at 1 watt output
Frequency response:	TAPE : 40 Hz to 40 kHz (± 3 dB) at 1 watt output

General

Power consumption:	45 watts (E Model) 40 watts (USA and Canada Model)
Power requirement:	120 V, 60 Hz ac (USA and Canada Model) 100, 120, 220, 240 V 50/60 Hz ac (E Model)
Dimensions:	532 (w) x 238 (h) x 393 (d) mm $20\frac{7}{8}$ (w) x $9\frac{3}{8}$ (h) x $15\frac{1}{2}$ (d) inches
Net weight:	12.3 kg (27 lb 2 oz) (without speaker)
Shipping weight:	21.5 kg (47 lb 4 oz)

Record Changer Section

Record changer:	BSR C-141R, three speeds (USA, Canada and E Model) ($33\frac{1}{3}$, 45,78 rpm) [E Model - - -Serial No. 401,001 and later] BSR C-141, four speeds (E Model only) ($16\frac{2}{3}$,$33\frac{1}{3}$,45,78 rpm) [Up to Serial No. 401,000]
Cartridge:	SONY Ceramic Cartridge VX-23P

Speaker Section

SS-170 A	2-way

Stereo Cassette Deck Section

TC-179

Tape speed:	4.8 cm/sec ($1\frac{7}{8}$ inch/sec)
Frequency response:	40 Hz to 10 kHz (−15 dB)

SONY®

SERVICE MANUAL

TABLE OF CONTENTS

Section	Title	Page
1.	**TECHNICAL DESCRIPTION**	
1-1.	Specifications	1
1-2.	Analysis for Newly Adopted Circuit	2
1-3.	Level Diagram	3
1-4.	Block Diagram	4
2.	**DISASSEMBLY AND REPLACEMENT**	
2-1.	Record Changer Removal	5
2-2.	Wooden Case Removal	5
2-3.	Rear Panel Removal	5
2-4.	Front Panel Removal	6
2-5.	Printed Circuit Board Removal	7
2-6.	Function, Mode, Cassette and Monitor Switch Replacement	7
2-7.	Dial-Cord Restringing	8
2-8.	Mechanical Dial Calibration	9
2-9.	Chassis Layout	9
3.	**ALIGNMENT AND ADJUSTMENTS**	
3-1.	FM I-F and Discriminator Alignment	10
3-2.	FM Frequency Coverage and Tracking Alignment	11
3-3.	FM Stereo Separation Adjustment	13
3-4.	A-M I-F Strip Alignment	14
3-5.	A-M Frequency Coverage and Tracking Alignment	14
4.	**RECORD CHANGER SERVICE**	
4-1.	Cartridge Replacement	15
4-2.	Stylus Tip Replacement	15
4-3.	Stylus Pressure Adjustment	16
4-4.	Adaptation to Local Power Line Frequency (E Model only)	16
4-5.	Adaptation to Local Power Line Voltage (E Model only)	16
5.	**REPACKING**	17
6.	**DIAGRAMS**	
	Mounting Diagram	
6-1.	Power Supply Board	18
6-2.	Fm (A-m) Front End/I-f Amp/MPX and Preamplifier Board (TM-010W2)	19
6-3.	Tone Control Board	23
6-4.	Power Amplifier Board (PM-011D)	25
	Schematic Diagram	
6-5.	Fm (A-m) Front End/I-f Amp/MPX and Preamplifier Section	27
6-6.	Audio Amplifier Section	29
7.	**EXPLODED VIEWS**	31
8.	**ELECTRICAL PARTS LIST**	34
	TC-179	39

SERVICING NOTE

When replacing the resistors or capacitors on the circuit board, cut leads of defective one and then solder new parts to the remainder of leads as shown in Fig. A. This permits you to repair easily.

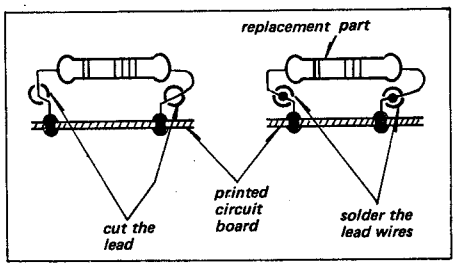


Fig. A. Resistor and capacitor replacement

SECTION 1

TECHNICAL DESCRIPTION

1-1. SPECIFICATIONS

Fm Tuner Section

Frequency range:	87.5 MHz ~ 108 MHz
Intermediate frequency:	10.7 MHz
Usable sensitivity:	2.2 μV (S/N = 30 dB)
Signal-to-noise ratio:	65 dB
Capture ratio:	4 dB
Selectivity:	35 dB (IHF)
Image rejection:	40 dB
I-f rejection:	90 dB
A-m suppression:	45 dB
Frequency response:	20 Hz ~ 15 kHz (± 3 dB)
Antenna:	300 ohms balanced
Harmonic distortion:	MONO: 0.5 % at 400 Hz, 100 % modulation STEREO: 1.0 % at 400 Hz, 100 % modulation
Fm-stereo separation:	Greater than 30 dB at 400 Hz
19 kHz, 38 kHz suppression:	45 dB

A-m Tuner Section

Frequency range:	530 kHz ~ 1,605 kHz
Intermediate frequency:	455 kHz
Sensitivity:	48 dB/m, built-in antenna 20 μV, external antenna
Signal-to-noise ratio:	50 dB
Image rejection:	40 dB at 600 kHz 35 dB at 1,400 kHz
I-f rejection:	40 dB at 1,000 kHz
Harmonic distortion:	0.8 %

Audio Amplifier Section

Music power output (EIA 5 %):	10 watts (8 Ω) total
Continuous power output (IHF 5 %): (rated output)	3 watts + 3 watts (8 Ω)
Harmonic distortion:	Less than 5 % at 1 kHz at rated output Less than 0.5 % at 1 kHz at 1 watt output
Frequency response:	TAPE: 40 Hz ~ 40 kHz, ± 3 dB at 1 watt output
Input sensitivity and impedance:	TAPE: 440 mV, 100 k ohms PHONO: 250 mV, 2.3 M ohms REC/PB (IN): 440 mV, 100 k ohms
Signal output:	REC OUT: 250 mV, 10 k ohms ※ REC/PB (OUT): 30 mV, 82 k ohms
Signal-to-noise ratio (With input shorted):	PHONO: 45 dB TAPE: 65 dB
Tone controls:	BASS: ± 10 dB at 100 Hz TREBLE: ± 10 dB at 10 kHz
Loudness:	+ 8 dB at 100 Hz + 4 dB at 10 kHz (at 30 dB attenuation)

Note: ※ E Model only

Record Changer Section

Record changer:	BSR C-141R, three speeds (USA, Canada and E Model) ($33\frac{1}{3}$,45,78 rpm) [E Model - - - Serial No. 401,001 and later] BSR C-141, four speeds (E Model only) ($16\frac{2}{3}$,$33\frac{1}{3}$,45,78 rpm) [Up to Serial No. 401,000]
Cartridge:	SONY ceramic cartridge VX-23P
Stylus:	SONY diamond stylus ND-127P
Number of records played automatically:	Up to 5 LP records

Speaker Section (SS-170A)

System:	2-way (16 cm ($6\frac{1}{2}$") woofer, 5 cm (2") tweeter)
Impedance:	8 ohms
Dimensions:	225 (w) x 380 (h) x 130 (d) mm $8\frac{7}{8}$ (w) x 15 (h) x $5\frac{1}{8}$ (d) inches
Net weight:	2.8 kg (6 lb 2 oz)

General

Power consumption:	40 watts (USA and Canada Model) 45 watts (E Model)
Power requirement:	120 V, 60 Hz ac (USA and Canada Model) 100 V, 120 V, 220 V, 240 V 50/60 Hz ac (E Model)

Dimensions:	532 (w) x 238 (h) x 393 (d) mm $20\frac{7}{8}$ (w) x $9\frac{3}{8}$ (h) x $15\frac{1}{2}$ (d) inches
Net weight:	12.3 kg (27 lb 2 oz) (without speaker)
Shipping weight:	21.3 kg (46 lb 12 oz)

1-2. ANALYSIS FOR NEWLY ADOPTED CIRCUIT

1. Fm/A-m I-f Strip

Notice that the RC coupled amplifier Q102 and tuned amplifier Q103 form an fm/a-m i-f amplifier stage. Changeover for tuned circuit is not necessary because of the wide difference in the intermediate frequencies. But dc bias changeover circuit for these amplifiers is provided to permit the proper operation both at fm and a-m i-f signal amplification. Referring to partial schematic diagram Fig. 1-1, dc bias changeover operation is performed by switching S1-1-2 (FUNCTION switch). In A-M mode, bias voltage is supplied through R128, R133. This holds the collector current of Q102 to 0.3 mA and Q103 to 2 mA, permitting proper amplification for a-m i-f signals. In FM mode, bias voltage is now supplied through paralleled circuit of R128/R129, R133/R135. This increases bias current ensuring limiter response in fm mode.

2. MPX Decoder Circuit

(a) Subchannel boost circuit

R202 and C201 form a subchannel signal boost circuit (high pass filter) and are inserted between SCA trap and base circuit of Q201 (19 kHz amplifier). This upgrades the channel separation without using negative-feedback type cancellation circuit. See Fig. 1-2.

(b) Frequency doubler circuit

Q202 and tuned circuit in the collector circuit forms a frequency doubler circuit. 19 kHz input signal is rectified between base-emitter junction and amplified at Q202 since it operates as class "C" amplifier. As 19 kHz pulses in the base circuit includes its higher-order harmonics, tank circuit tuned to 38 kHz is inserted in the collector to restore 38 kHz sinusoidal waveform. This signal is transformer coupled to bridge-type demodulator to supply sampling drive for the demodulator. See Fig. 1-2.

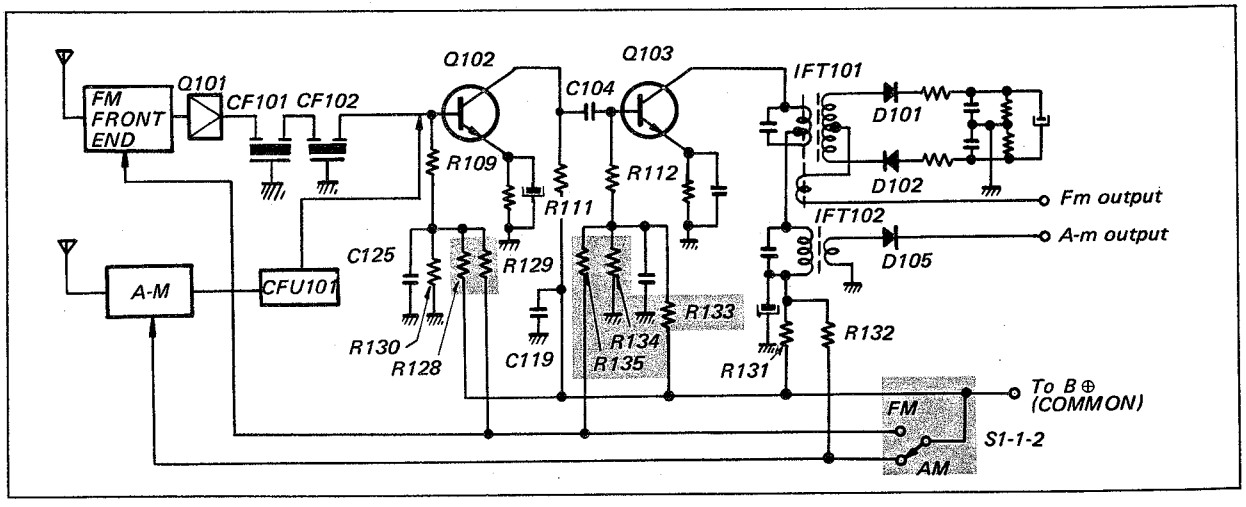


Fig. 1-1. Partial schematic diagram of fm/a-m i-f strip

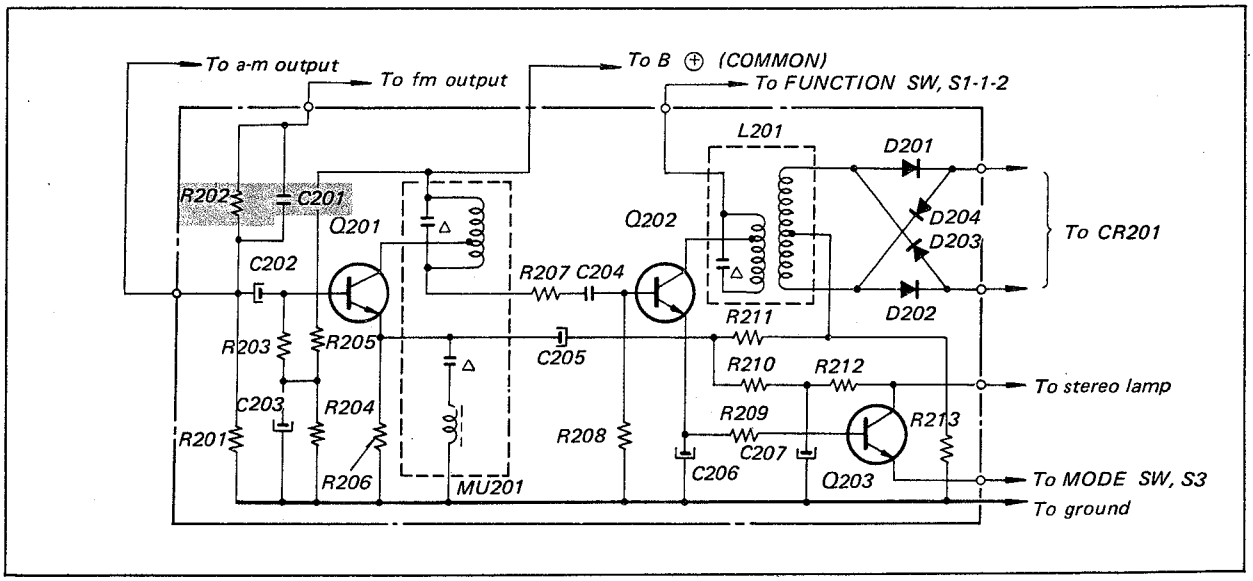
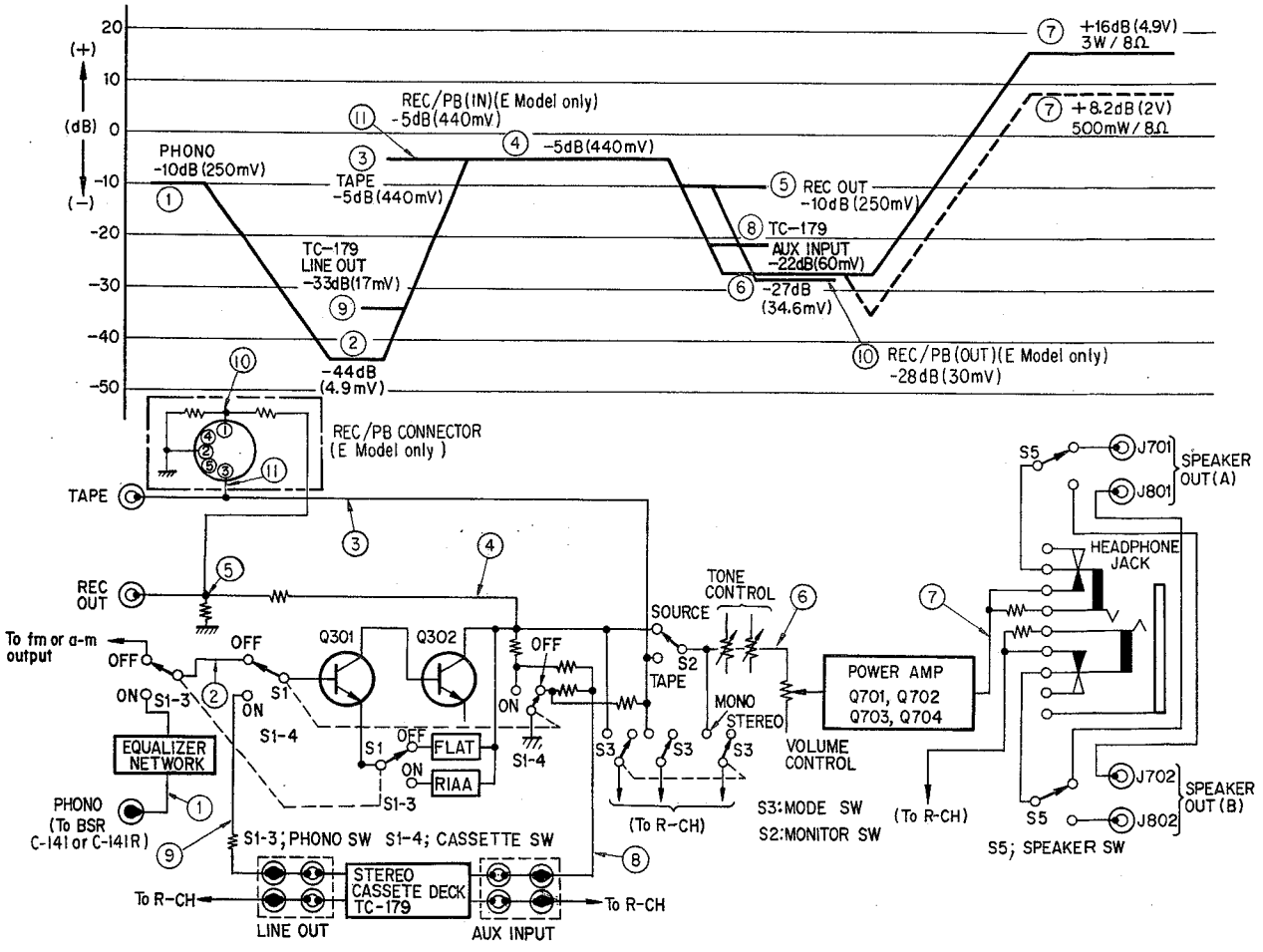


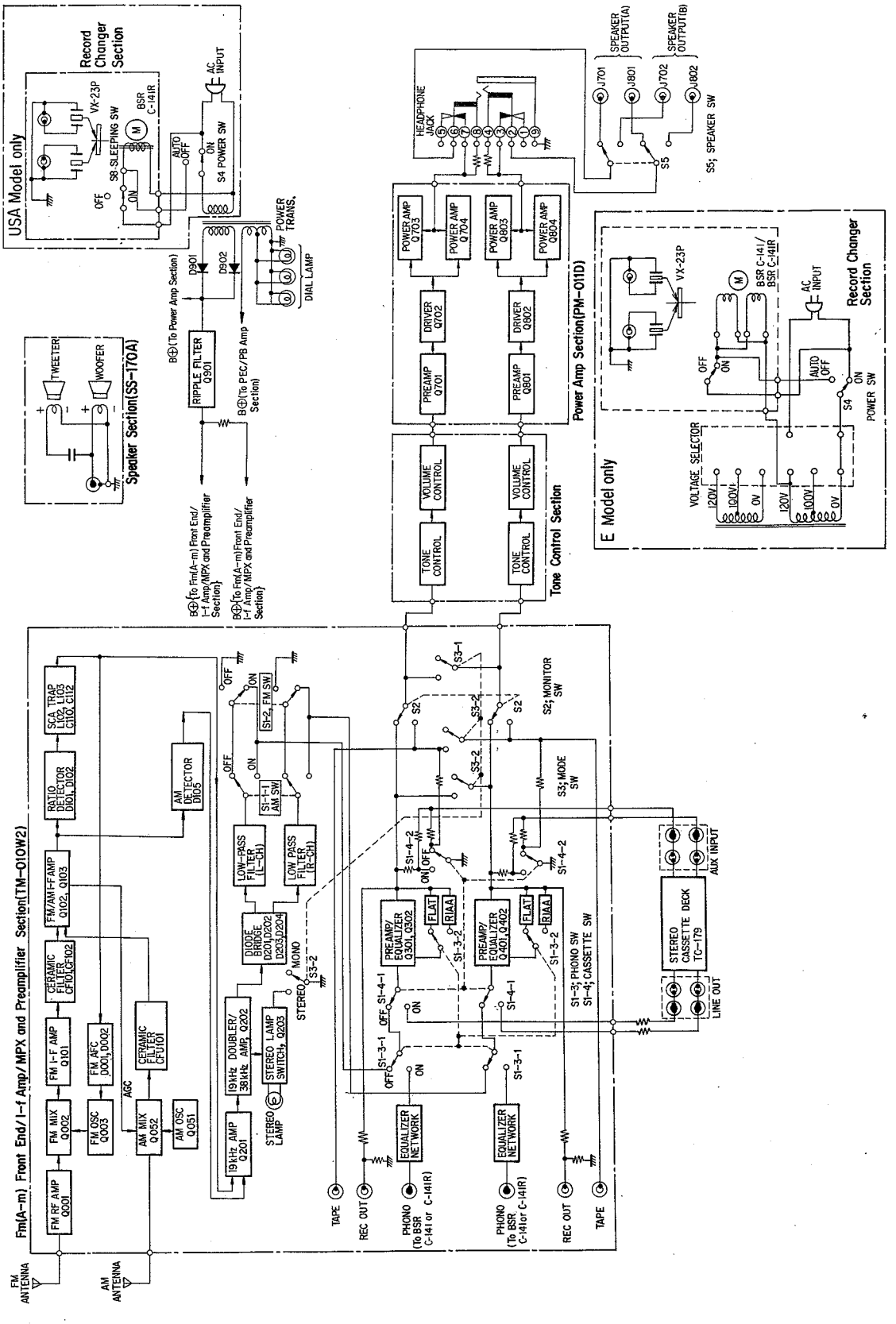
Fig. 1-2. Partial schematic diagram of MPX decoder

1-3. LEVEL DIAGRAM



Note: Signal voltages are measured with ac VTVM and expressed in dB referred to 0.775 V, 1 kHz.

1-4. BLOCK DIAGRAM



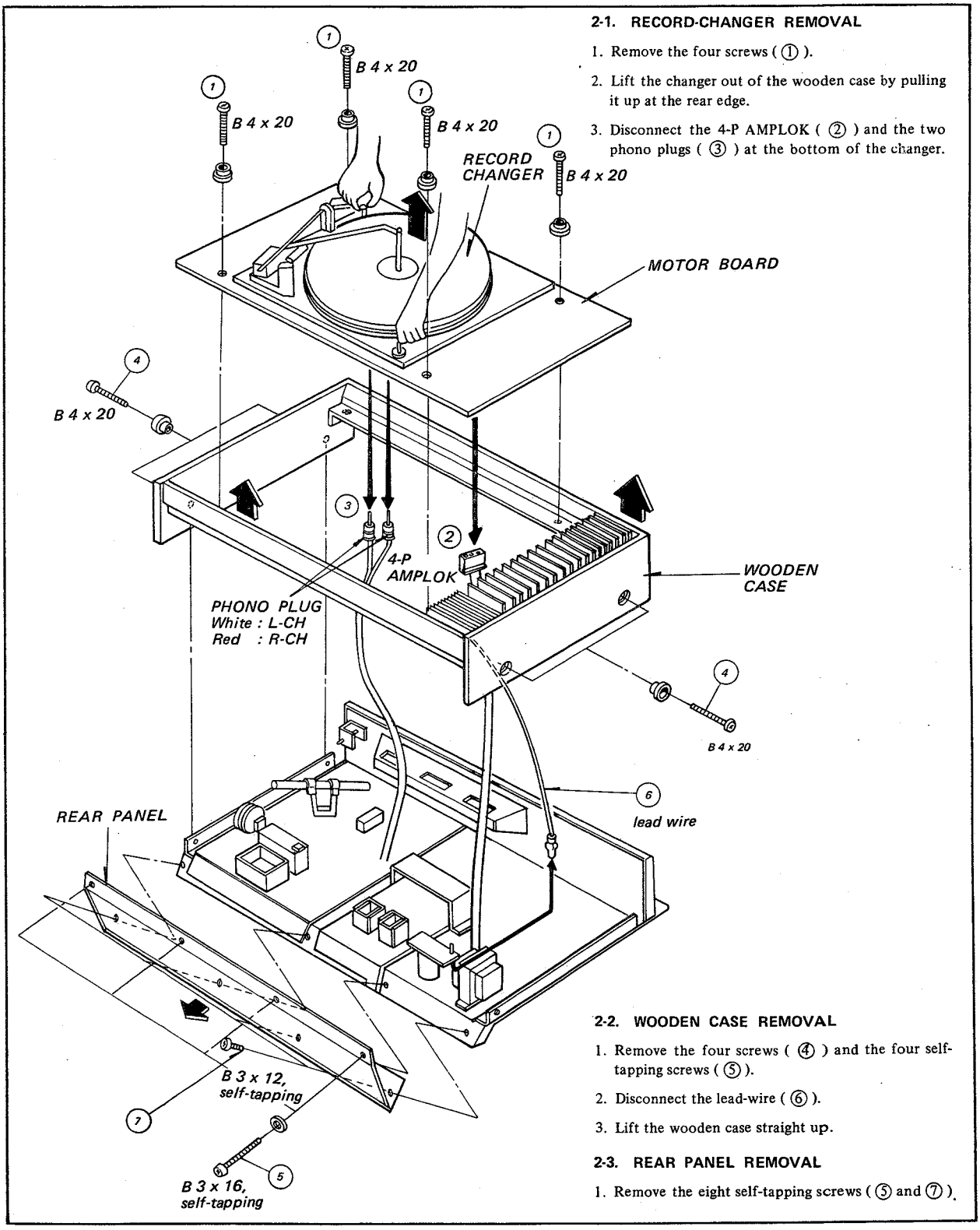
SECTION 2

DISASSEMBLY AND REPLACEMENT

WARNING

Unplug the ac power cord before starting any disassembly or replacement procedures.

Note: All screws in this service manual are Phillips type (cross recess type) unless otherwise indicated.
(—); slotted head



2-1. RECORD-CHANGER REMOVAL

1. Remove the four screws (①).
2. Lift the changer out of the wooden case by pulling it up at the rear edge.
3. Disconnect the 4-P AMPLOK (②) and the two phono plugs (③) at the bottom of the changer.

2-2. WOODEN CASE REMOVAL

1. Remove the four screws (④) and the four self-tapping screws (⑤).
2. Disconnect the lead-wire (⑥).
3. Lift the wooden case straight up.

2-3. REAR PANEL REMOVAL

1. Remove the eight self-tapping screws (⑤ and ⑦).

Fig. 2-1. Record changer, wooden case and rear panel removal

2-4. FRONT PANEL REMOVAL

1. Remove the wooden case and record changer as shown in Fig. 2-1.
2. Remove the five control knobs (⑧ , ⑨ and ⑩) by pulling them off.
3. Remove the three hexagon-head collars (⑪) and two MIC jack nuts (⑫).
4. Remove the four screws (⑬).

– Continued to Fig. 2-3. –

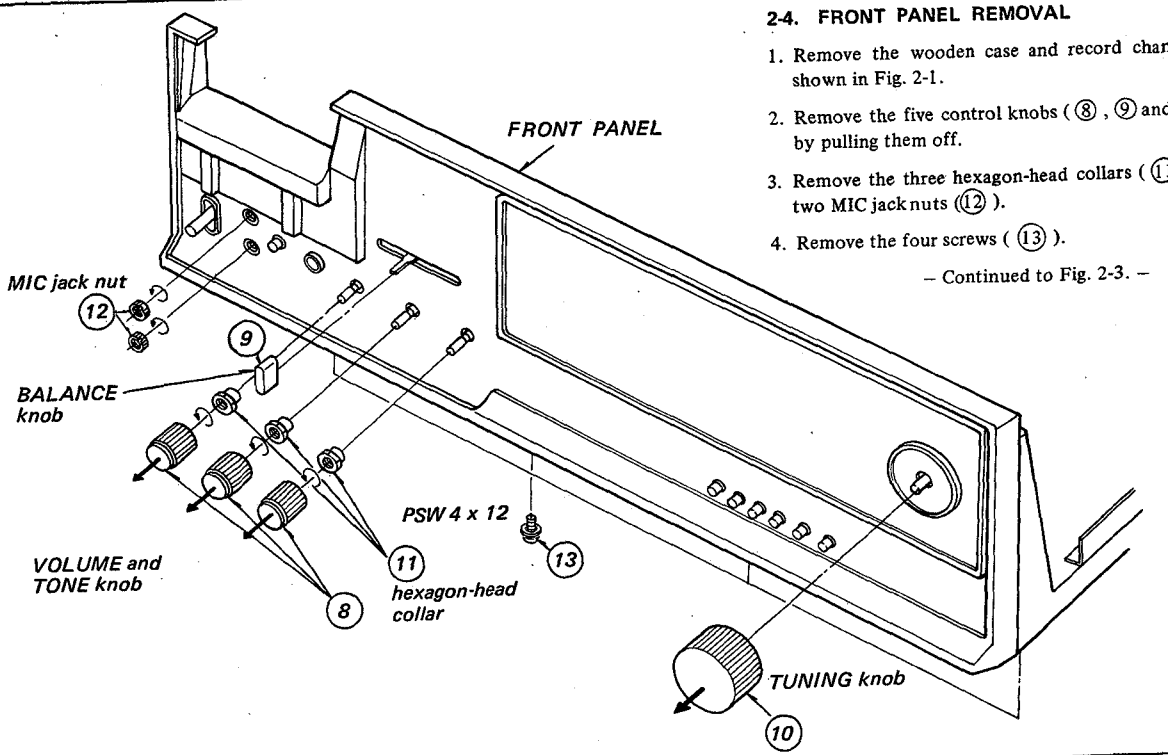
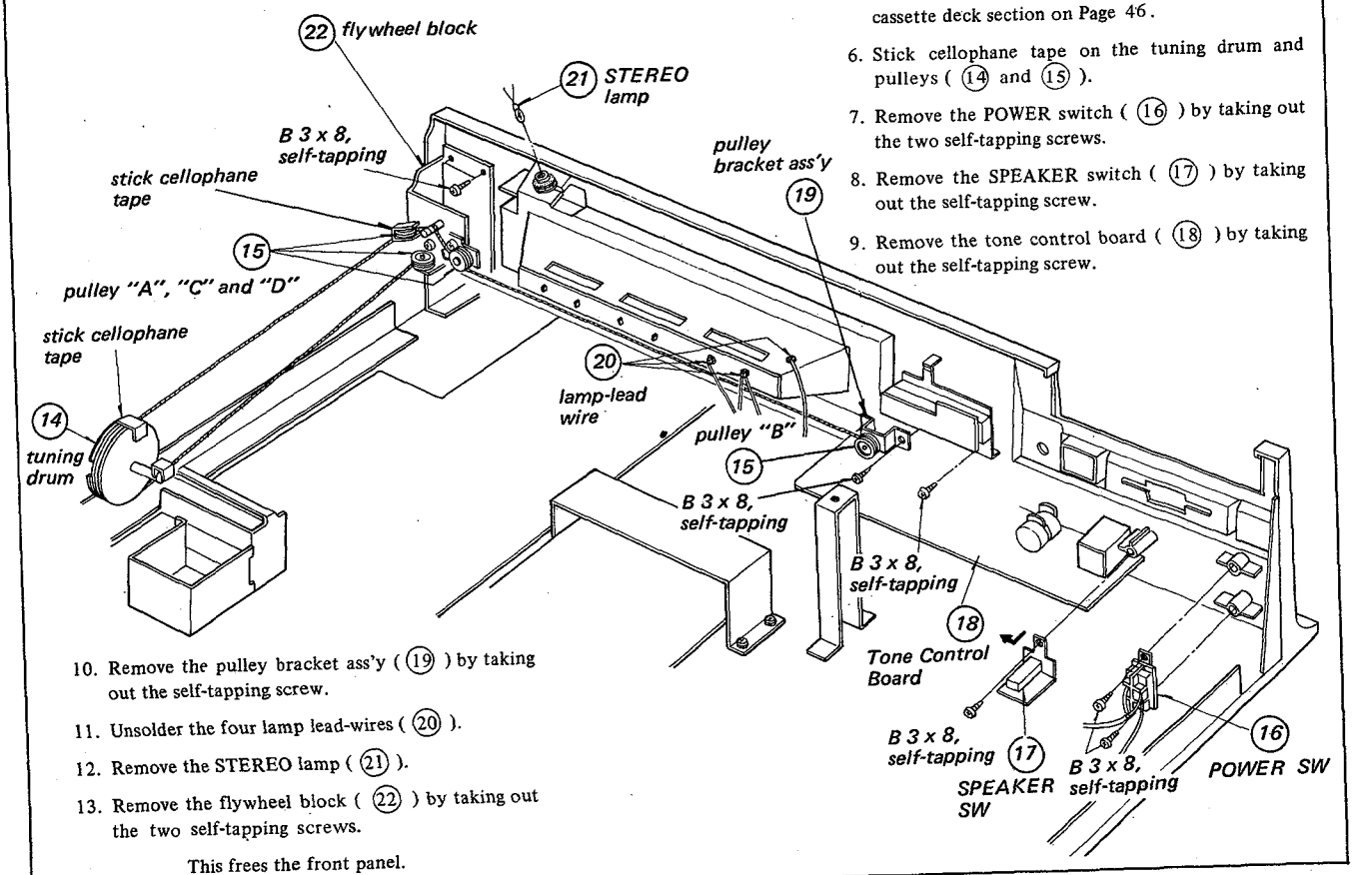


Fig. 2-2. Front panel removal (1)

5. Remove the stereo cassette deck as described in cassette deck section on Page 46.
6. Stick cellophane tape on the tuning drum and pulleys (⑭ and ⑮).
7. Remove the POWER switch (⑯) by taking out the two self-tapping screws.
8. Remove the SPEAKER switch (⑰) by taking out the self-tapping screw.
9. Remove the tone control board (⑱) by taking out the self-tapping screw.



10. Remove the pulley bracket ass'y (⑲) by taking out the self-tapping screw.
11. Unsolder the four lamp lead-wires (⑳).
12. Remove the STEREO lamp (㉑).
13. Remove the flywheel block (㉒) by taking out the two self-tapping screws.

This frees the front panel.

Fig. 2-3. Front panel removal (2)

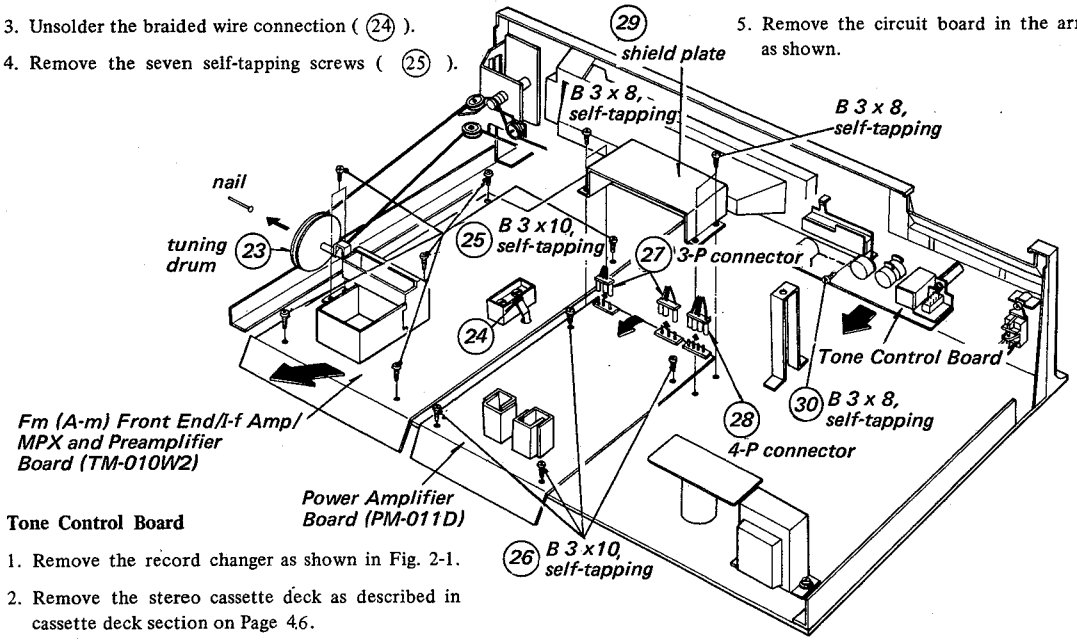
2-5. PRINTED CIRCUIT BOARD REMOVAL

Fm(A-m) Front End/I-f Amp/MPX and Preamplifier board

1. Remove the record changer and rear panel as shown in Fig. 2-1.
2. Remove the tuning drum ((23)), then hook it to the nail on the wooden case.
3. Unsolder the braided wire connection ((24)).
4. Remove the seven self-tapping screws ((25)).

Power Amplifier Board

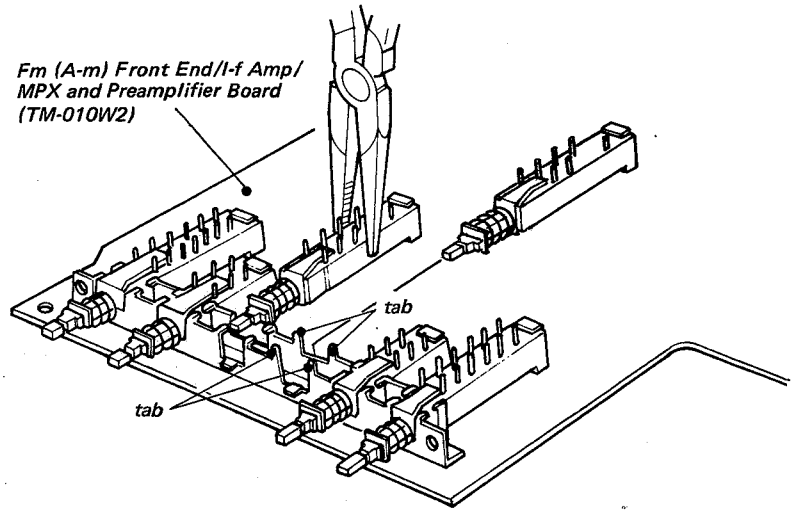
1. Remove the record changer as shown in Fig. 2-1.
2. Remove the four self-tapping screws ((26)).
3. Disconnect the two 3-p and a 4-p connectors ((27) and (28)).
4. Remove the shield plate ((29)) by taking out the four self-tapping screws.
5. Remove the circuit board in the arrow direction as shown.



Tone Control Board

1. Remove the record changer as shown in Fig. 2-1.
2. Remove the stereo cassette deck as described in cassette deck section on Page 4.6.
3. Remove the four control knobs ((8) and (9)) by pulling them off as shown in Fig. 2-2.
4. Remove the three hexagon-head collars ((11)) shown in Fig. 2-2.
5. Remove the self-tapping screw ((30)).
6. Remove the circuit board in the arrow direction as shown.

Fig. 2-4. Printed circuit board removal



2-6. FUNCTION, MODE, CASSETTE AND MONITOR SWITCH REPLACEMENT

If any of 5-gang or 6-gang push-button switch is defective, replace the defective switch only.

1. Remove the required switch from a new pushbutton switch ass'y.
2. Straighten the tabs of switch bracket by using a pliers.
3. With a soldering-iron having solder-sucking tip, clean solder from each lug of the defective switch and the printed circuit board.
4. Remove the defective switch.
5. Install a new switch prepared in step 1.

Fig. 2-5. FUNCTION, MODE, CASSETTE and MONITOR switch replacement

2-7. DIAL-CORD RESTRINGING

Preparation

1. Remove the wooden case as shown in Fig. 2-1 on page 5.
2. Cut a 63-inch (1,600 mm) length of $^{1}/_{64}$-inch (0.3 mm) diameter dial cord.
3. Tie the end of the cord to a spring as shown in Fig. 2-6.
4. Rotate the tuning drum fully clockwise (maximum capacitance position).

Procedure

1. Referring to Fig. 2-6, proceed the stringing in numerical order as shown.

Note: Refer to the Fig. 2-7, for wrapping the cord around the drum. At the finish point of stringing, tighten the cord so that the spring is under tension, and squeeze the eyelet.

2. After completing the dial cord stringing, make sure that the tuning system works properly.
3. Apply a drop of contact cement to the finish point.
4. Perform the mechanical dial calibration as described in procedure 2-8.

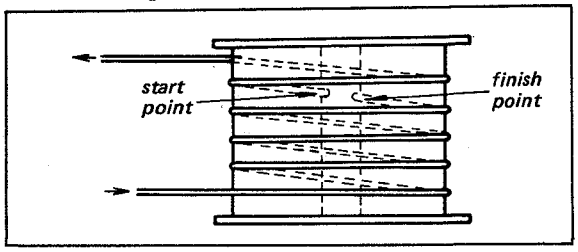


Fig. 2-7. Wrapping the dial cord

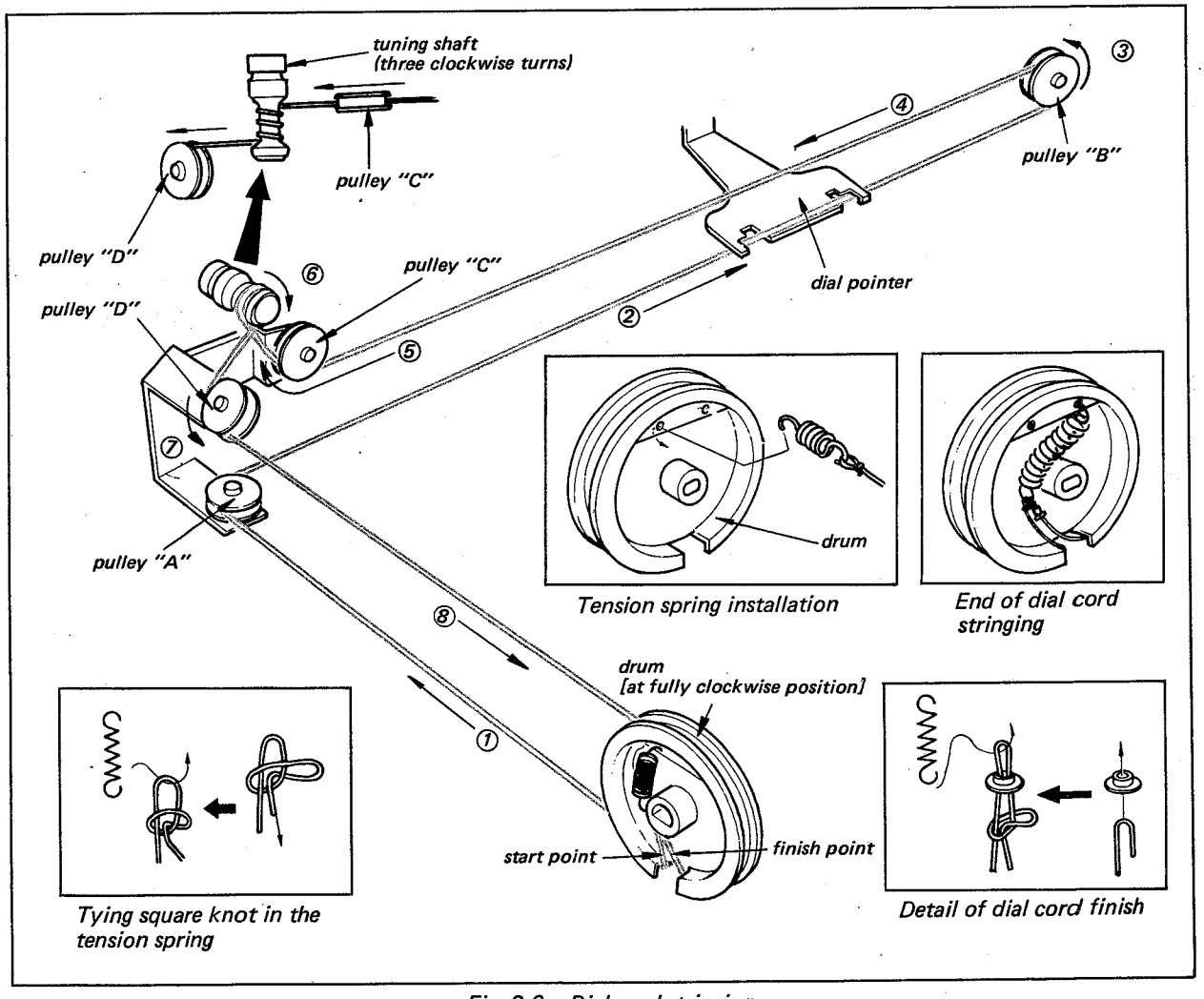


Fig. 2-6. Dial cord stringing

2-8. MECHANICAL DIAL CALIBRATION

Note: This is required after replacing the dial cord.

1. Put the dial pointer on the cord as shown in Fig. 2-8, and move it to a position where the pointer coincides with the 530 kHz mark on the dial scale as shown in Fig. 2-9, when the tuning capacitor is set to the maximum capacitance position.

2. Perform the precise dial calibration by utilizing off-the-air local a-m signals, then apply a drop of contact cement to the pointer.

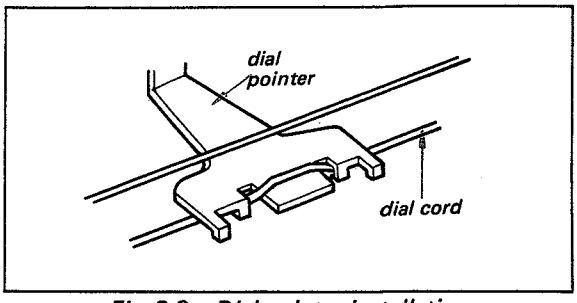


Fig. 2-8. Dial pointer installation

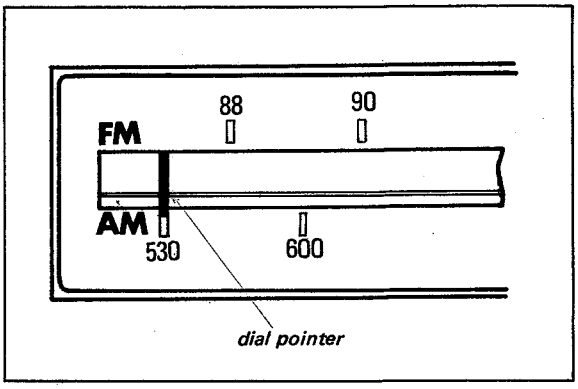
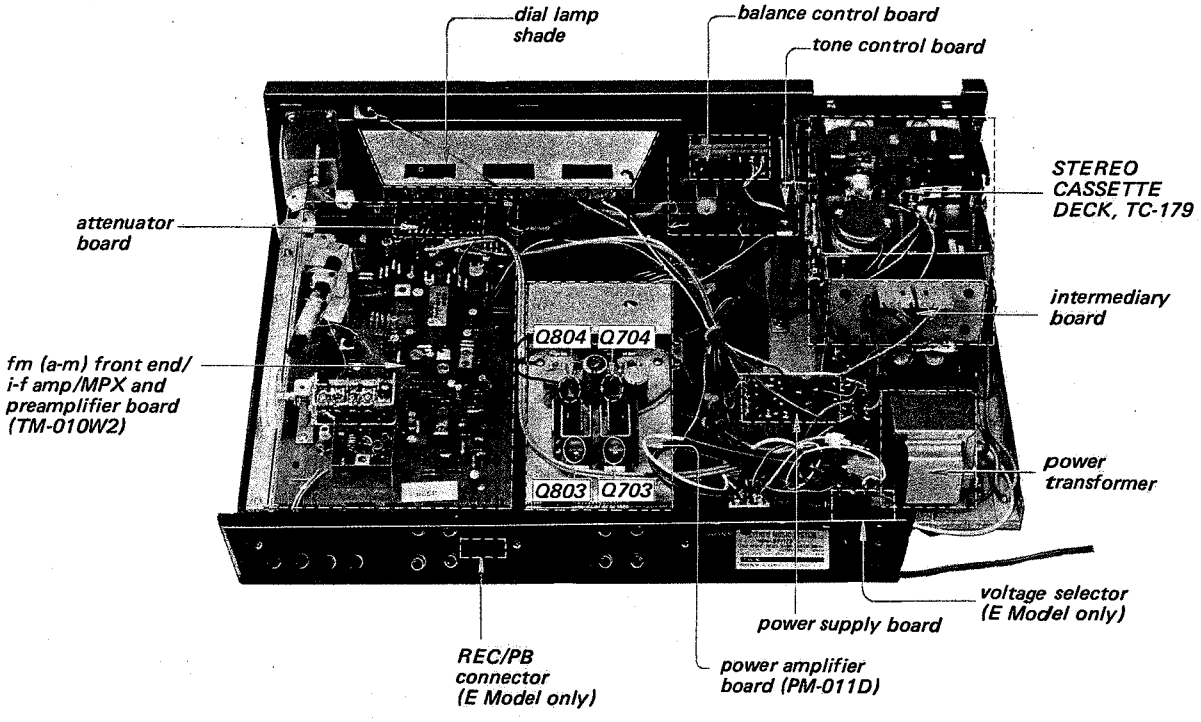


Fig. 2-9. Mechanical dial calibration

2-9. CHASSIS LAYOUT



SECTION 3

ALIGNMENT AND ADJUSTMENTS

3-1. FM I-F AND DISCRIMINATOR ALIGNMENT

CAUTION

The ceramic filters in the fm i-f circuit are selected according to their specified center frequencies and color coded as shown in Fig. 3-1 and listed in Table 3-1. Check the color code of the filters to identify the same center frequency when replacing any of these filters.

TABLE 3-1.
FM I-F CERAMIC FILTERS

Part No.	*Color*	*Specified Center Freq.*
1-403-562-11	red	10.70 MHz
1-403-562-31	white	10.74 MHz
1-403-562-51	yellow	10.78 MHz

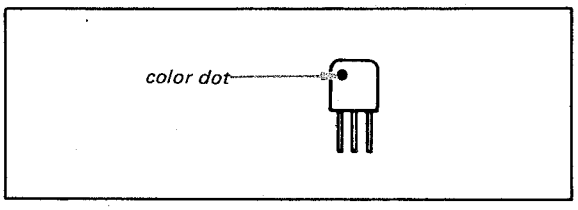


Fig. 3-1. Color dot on ceramic filter

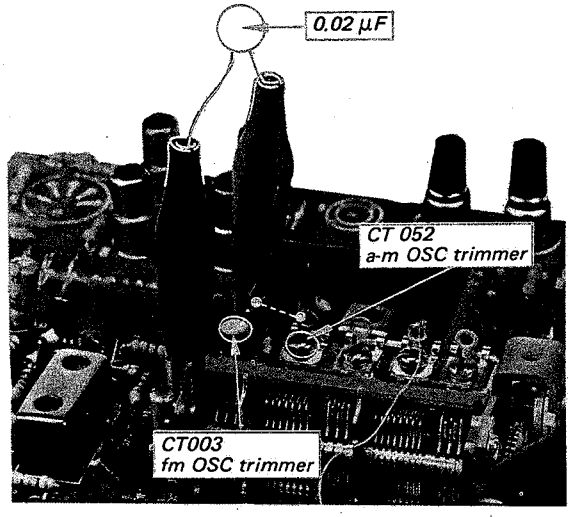


Fig. 3-2. Interruption of fm or a-m local oscillator operation

Note: Local oscillator should be killed when performing this alignment. To stop the local oscillator operation, shunt the oscillator capacitor with a 0.02 µF capacitor. See Fig. 3-2.

Signal Generator Method

Test Equipment Required

1. Signal generator capable of generating a 10.7-MHz a-m/fm signal.
2. Oscilloscope

   Vertical sensitivity . . . . . 100 mV/cm minimum
3. Alignment tools

Preparation

1. Connect the input cable of the oscilloscope with alligator clips to C113 and ground on the fm (a-m) front end/i-f amp/MPX and preamplifier board and solder a 0.02 µF capacitor across these clips, as shown in Fig. 3-3.
2. Connect the output cable of the generator across CV002 on the fm (a-m) front end/i-f amp/MPX and preamplifier board through a 0.02 µF coupling capacitor as shown in Fig. 3-4.

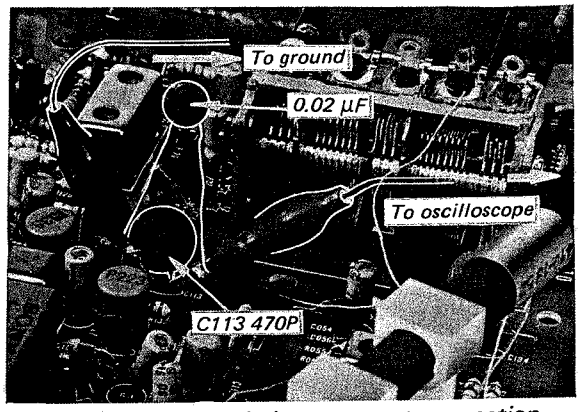


Fig. 3-3. Fm discriminator output connection

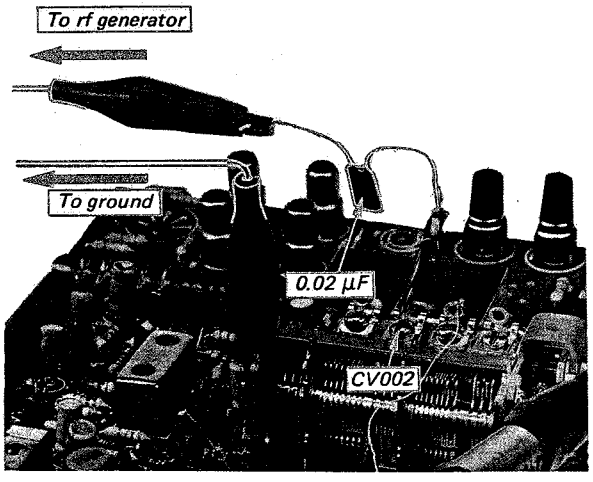


Fig. 3-4. 10.7 MHz signal injection

Procedure

1. With the equipment connected as shown in Fig. 3-5, set the signal-generator controls as follows:

   Frequency . . . . . Specified center frequency of ceramic filter. See Table 3-1.
   Modulation . . . . . Fm, 400 Hz, 100 % (75 kHz)
   Output level . . . . . 1,000 μV (60 dB)

2. Set the receiver controls as follows:

   FUNCTION switch . . FM
   VOLUME control . . . Minimum

3. Adjust the signal generator frequency slightly to obtain a maximum output, and then change the signal generator modulation to a-m, 400 Hz 30 %.

4. If the discriminator transformer IFT101 is not aligned correctly, 400-Hz ripple will be observed as shown in Fig. 3-6.

5. Turn the secondary side core (green) of discriminator transformer IFT101 (See Fig. 3-10) with an alignment tool to obtain a minimum indication on the oscilloscope as shown in Fig. 3-6.

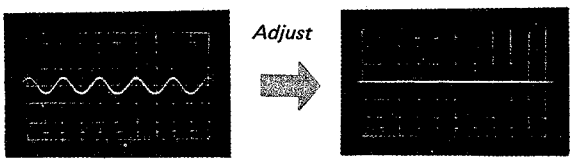


Fig. 3-6. Fm discriminator alignment output response

Note: Turn the core carefully and slowly because the output appearing on the oscilloscope jumps up and down when turning the core. This might cause difficulty in determining the point of minimum output. Also, at both extreme positions of the top core, decreased output will be observed. The real null point should be obtained in the middle of the core thread length, and maximum output occurs at each side of the true null point.

6. Change the signal generator modulation to fm, 400 Hz 100 % (75 kHz).

7. Turn the core of fm IFT001 and primary side core (brown) of discriminator transformer IFT101 (See Fig. 3-10) to obtain the maximum output.

3-2. FM FREQUENCY COVERAGE AND TRACKING ALIGNMENT

Note: Before starting this alignment, the fm i-f and discriminator alignment should be performed.

Signal Generator Method

Test Equipment Required

1. Fm signal generator
2. Ac VTVM
3. Alignment tools

Preparation

1. Connect the equipment as shown in Fig. 3-8.
2. Set the receiver controls as follows:

   FUNCTION switch . . FM
   VOLUME control . . . Minimum

3. Short the connection point of R013 and C017, (T13) and ground (T12), as shown in Fig. 3-7.

Follow the procedures given in Table 3-2 when performing this alignment with an fm signal generator. Be sure that the dial is mechanically calibrated.

Off-the-Air Signal Method

Accurate frequency-coverage alignment can also be performed by utilizing off-the-air local fm signals. However, before performing this alignment, be sure that the dial is mechanically calibrated and AFC circuit is shorted to ground.

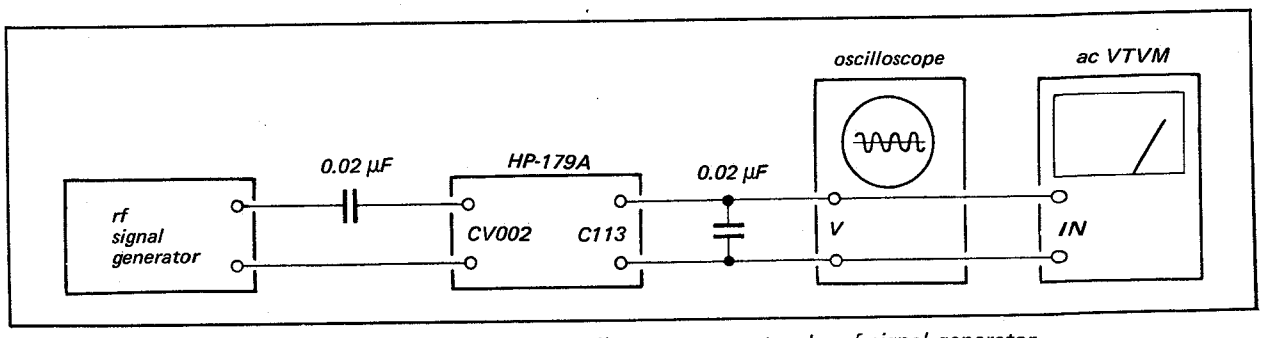


Fig. 3-5. Fm discriminator alignment test setup by rf signal generator

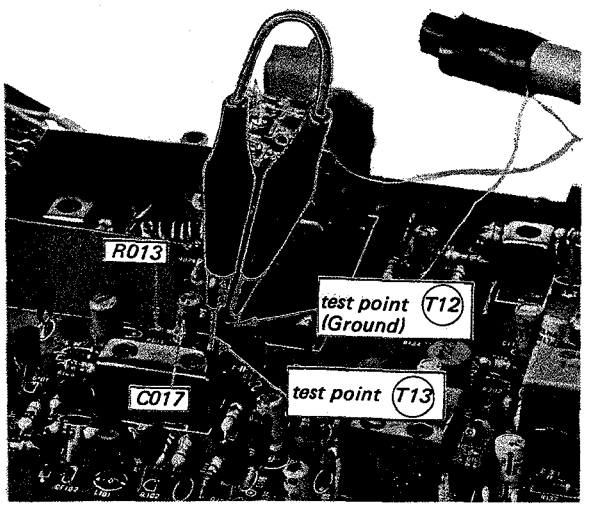


Fig. 3-7. Interruption of AFC circuit

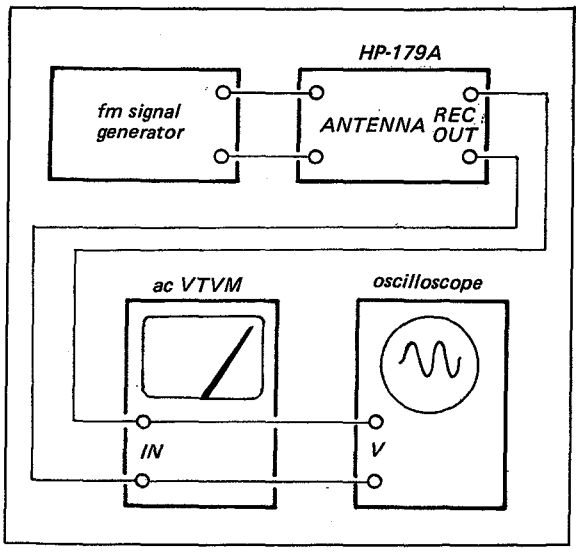


Fig. 3-8. Fm frequency coverage and tracking alignment test setup

TABLE 3-2. FM FREQUENCY COVERAGE AND TRACKING ALIGNMENT

Step	Coupling Between Receiver and SG	SG Frequency and Output Level	Dial Indication	Ac VTVM Connection	Adjust	Indication
	FM FREQUENCY COVERAGE ALIGNMENT					
1.	Direct coupling	87.2 MHz 400 Hz 100 % mod. Output level; as low as possible	lowest position	REC OUT	OSC coil L003 See Fig. 3-10.	Maximum VTVM reading
2.	Same as above	108.4 MHz 400 Hz 100 % mod. Output level; as low as possible	highest position	Same as above	OSC trimmer CT003 See Fig. 3-10.	Same as above
	FM TRACKING ALIGNMENT					
1.	Direct coupling	87.2 MHz 400 Hz 100 % mod. Output level; as low as possible	lowest position	REC OUT	RF coil L002 Antenna coil L001 See Fig. 3-10.	Maximum VTVM reading
2.	Same as above	108.4 MHz 400 Hz 100 % mod. Output level; as low as possible	highest position	Same as above	RF trimmer CT002 Antenna trimmer CT001 See Fig. 3-10.	Same as above

3-3. FM STEREO SEPARATION ADJUSTMENT

Test Equipment Required

1. Fm stereo signal generator
2. Ac VTVM
3. Oscilloscope
4. Alignment tools

Procedure

1. Connect the equipment as shown in Fig. 3-9, then set the fm stereo signal generator controls as follows:

Carrier frequency	98 MHz
Output level	1,000 μV (60 dB)
Mode	Stereo
Audio (400 Hz) Mod . . .	67.5 kHz (90 %)*
Pilot (19 kHz) Mod	7.5 kHz (10 %)

* **Note:** 75 kHz (100 %) if metering indicates total modulation (audio + pilot)

2. Precisely tune the set to the signal-generator carrier frequency then turn the top core of switching transformer L201 (See Fig. 3-10) to obtain maximum output at the left channel.
3. Record the output level of the left channel when the MPX generator input selector is set to the left channel.
4. Switch the input selector to the right channel and read the residual signal level in the left channel.
5. The output-level to residual-level ratio represents the separation. Turn the top core of switching transformer L201 (See Fig. 3-10) for minimum residual level. Check the right channel for separation.
6. Readjust switching transformer L201 for minimum difference between left- and right- channel separation.

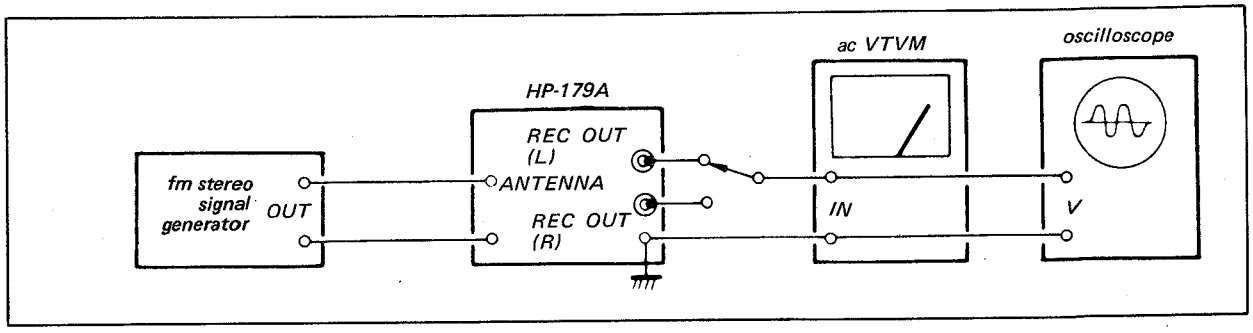


Fig. 3-9. Fm stereo separation adjustment test setup

Adjustment Parts Location

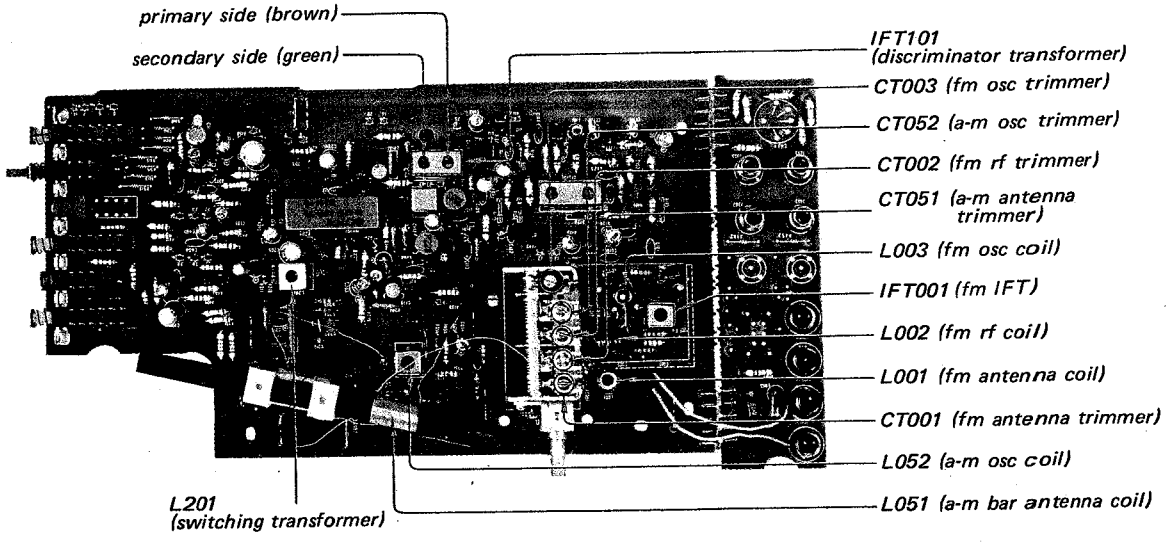


Fig. 3-10. Adjustment Parts location

3-4. A-M I-F STRIP ALIGNMENT

Note: The a-m i-f transformers (CFU101 and IFT102) are shipped from the factory with all adjustments set for correct operation. Therefore no adjustment is required in field service.

3-5. A-M FREQUENCY COVERAGE AND TRACKING ALIGNMENT

Preparation

Set the Function Switch to AM.

Signal Generator Method

Test Equipment Required

1. Signal generator
2. Loop antenna
3. Ac VTVM

Procedure

With the equipment connected as shown in Fig. 3-11, follow the procedures given in Table 3-3 when performing this alignment with an a-m signal generator.

Off-the-Air Signal Method

Accurate frequency-coverage and tracking alignment can also be performed by utilizing off-the-air local a-m signals. However, before performing this alignment, be sure that the dial is mechanically calibrated.

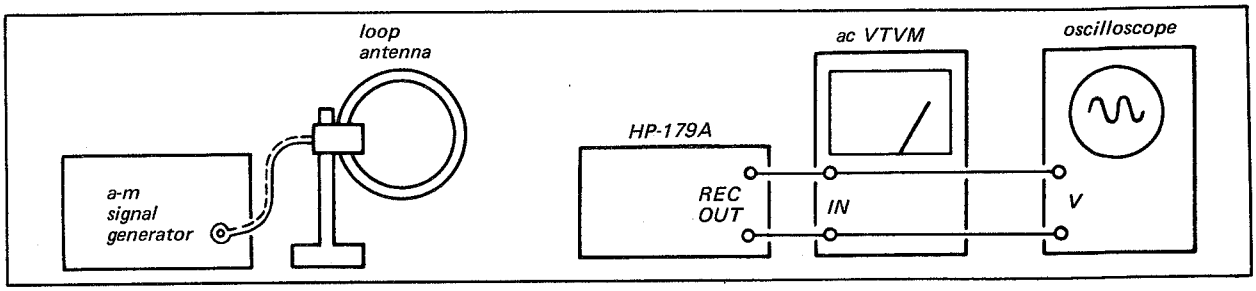


Fig. 3-11. A-m frequency coverage and tracking alignment test setup

TABLE 3-3. A-M FREQUENCY COVERAGE AND TRACKING ALIGNMENT

	A-M FREQUENCY COVERAGE ALIGNMENT				
SG Coupling	**SG Frequency and Output Level**	**Dial Indication**	**Ac VTVM Connection**	**Adjust**	**Indication**
Loop antenna	520 kHz 400 Hz 30 % mod. Output level; as low as possible	lowest position	REC OUT	OSC coil L052 See Fig. 3-10.	Maximum VTVM reading
Same as above	1,680 kHz Same as above	highest position	Same as above	OSC trimmer CT052 See Fig. 3-10.	Same as above
	A-M TRACKING ALIGNMENT				
Loop antenna	600 kHz 400 Hz 30 % mod. Output level; as low as possible	tune to the SG signal	REC OUT	Position of antenna coil L051 See Fig. 3-10.	Maximum VTVM reading
Same as above	1,400 kHz Same as above	Same as above	Same as above	Antenna trimmer CT051 See Fig. 3-10.	Same as above

SECTION 4

RECORD CHANGER SERVICE

Note: BSR C-141 . . . . E Model only
(Up to Serial No. 401,000)
BSR C-141R . . . . USA, Canada, E Model
USA and Canada
Model . . . . . Installed in all units
E Model . . . . . Serial No. 401,001 and later

WARNING

Make sure that the power cord is disconnected from the ac outlet before performing any of these procedures.

4-1. CARTRIDGE REPLACEMENT

– BSR C-141 –

Remove the screw (⊕ K 2.6 x 8) securing the cartridge to the shell head as shown in Fig. 4-1 (a).

– BSR C-141R –

1. Pry out the masking plate with a small screwdriver as shown in Fig. 4-1 (b).
2. Remove the screw (⊕K 2.6 x 8) securing the cartridge to the shell head as shown in Fig. 4-1.(b).

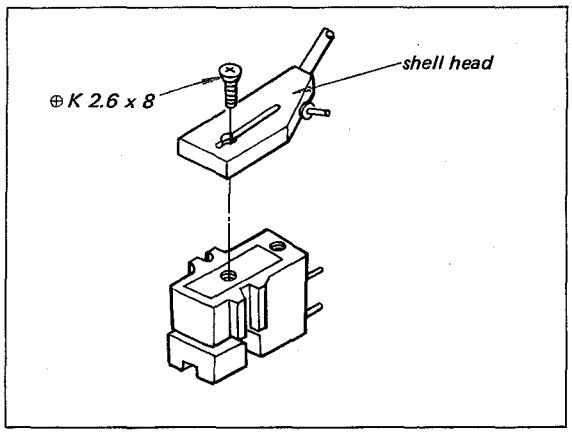


Fig. 4-1 (a). Cartridge replacement (BSR C-141)

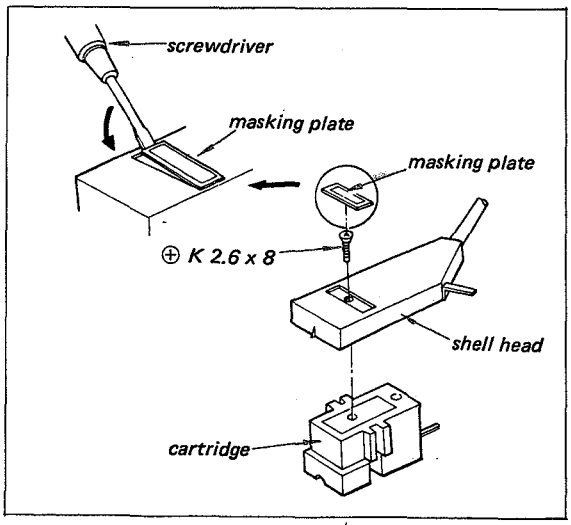


Fig. 4-1 (b). Cartridge replacement (BSR C-141R)

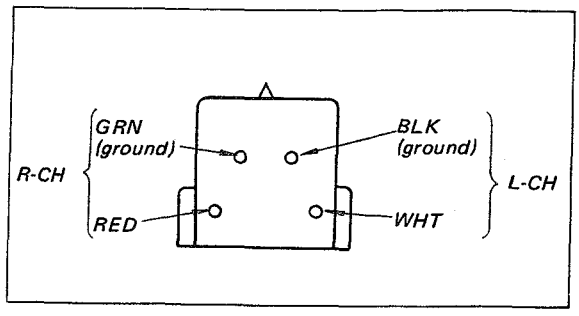


Fig. 4-2. Wiring diagram

4-2. STYLUS TIP REPLACEMENT

1. Remove the defective stylus tip with your fingers as shown in Fig. 4-3 (a) and 4-3 (b). Follow the sequence number as illustrated.
2. Install a new one.

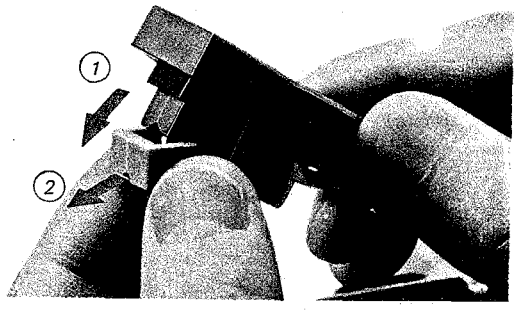


Fig. 4-3 (a). BSR C-141's stylus tip replacement

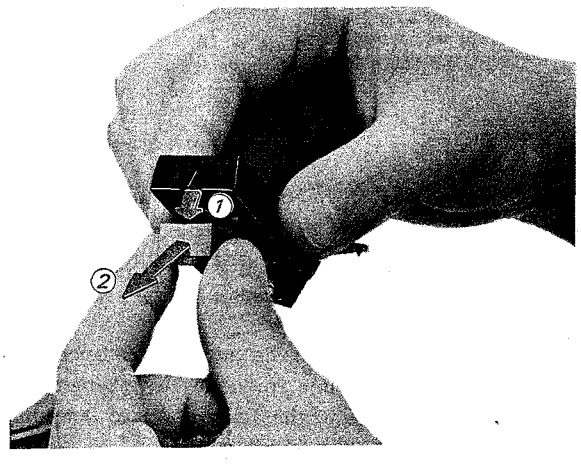


Fig. 4-3 (b). BSR C-141R's stylus tip replacement

4-3. STYLUS PRESSURE ADJUSTMENT

1. – BSR C-141 –

The stylus pressure should always be set to the recommended value of 4 grams which is indicated on the stylus pressure gauge as shown in Fig. 4-4 (a).

– BSR C-141R –

The stylus pressure should always be set to the recommended value of center position which is indicated on the stylus pressure gauge as shown in Fig. 4-4 (b).

Note: Adjustment procedures of record changer are described in the BSR C-141/ BSR C-141R service manual supplied.

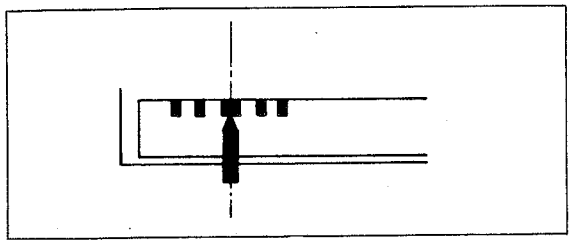


Fig. 4-4 (a). BSR C-141's stylus pressure adjustment

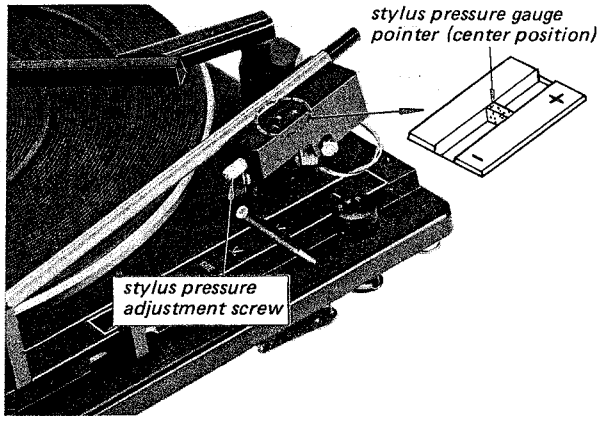


Fig. 4-4 (b). BSR C-141R's stylus pressure adjustment

4-4. ADAPTATION TO LOCAL POWER LINE FREQUENCY (E Model only)

The turntable can be adapted to operate at the alternate power-line frequency by changing the motor pulley. Refer to the TABLE 4-1 to determine the part number of the proper pulley.

Note: Only the E Model, which has a four-pole drive motor with two field coils, can be adapted according to this procedure, otherwise replace the complete motor assembly.

TABLE 4-1. MOTOR PULLEYS

Record Changer	Description	Part Number
BSR C-141	50 Hz pulley (4-pole motor)	2-070-133-00
	60 Hz pulley (4-pole motor)	2-070-132-00
BSR C-141R	50 Hz pulley (4-pole motor)	2-070-133-00
	60 Hz pulley (4-pole motor)	2-070-132-00

1. Remove the record changer as described in Procedure 2-1 on page 5.
2. Pull off the manual-play or automatic-play spindle from the turntable shaft.
3. Pry the nylon cover and ornamental disc off the platter with a small screwdriver.
4. Remove the platter by prying out the retaining ring around the shaft with a small screwdriver as shown in Fig. 4-5.
5. Pull off the motor pulley while loosening the spring with a long-nose pliers. If it is difficult to loosen the spring, take out the motor assembly by removing the three retaining rings and disconnecting the motor leads, then perform the motor-pulley removal.
6. Install the proper pulley and reassemble the changer.

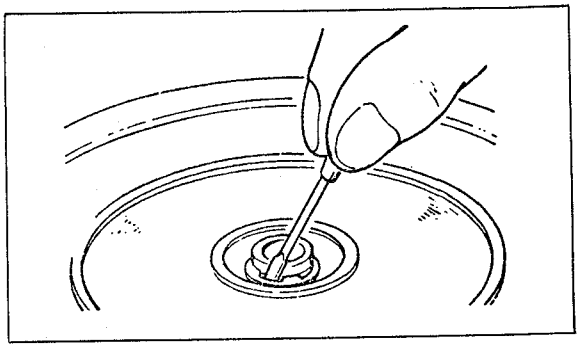


Fig. 4-5. Retaining-ring removal

4-5. ADAPTATION TO LOCAL POWER LINE VOLTAGE (E Model only)

HP-179A can be adapted to operate at serveral different line voltage by simply plugging the voltage selector in the proper voltage without changing the motor wiring of the Record Changer.
Voltage selector is mounted on the rear panel.

SECTION 5
REPACKING

The original shipping carton and packing materials are the ideal containers for shipping the unit. However to secure the maximum protection, the receiver must be repacked in these materials precisely as before. The proper repacking procedures are shown in Fig. 5-1.

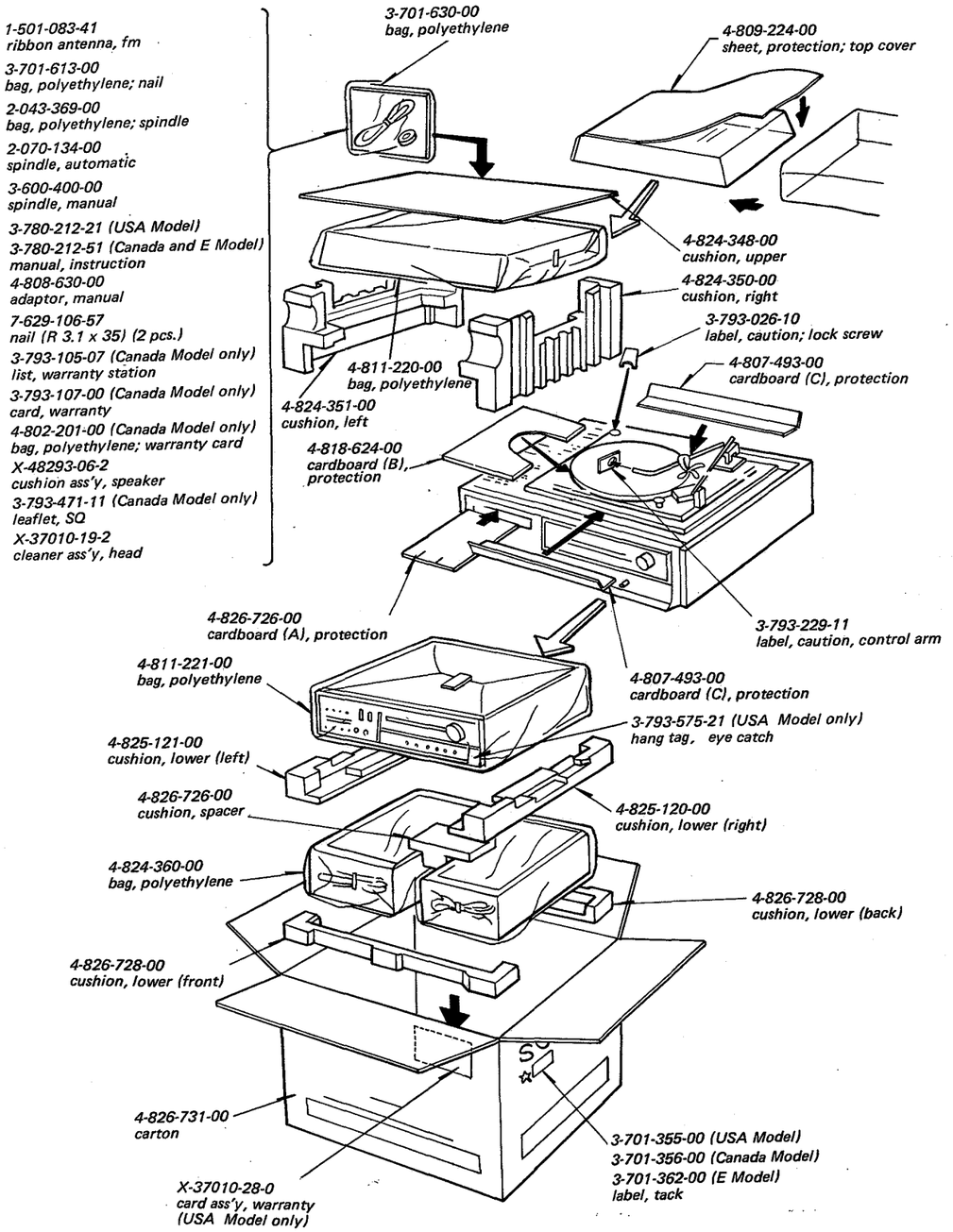
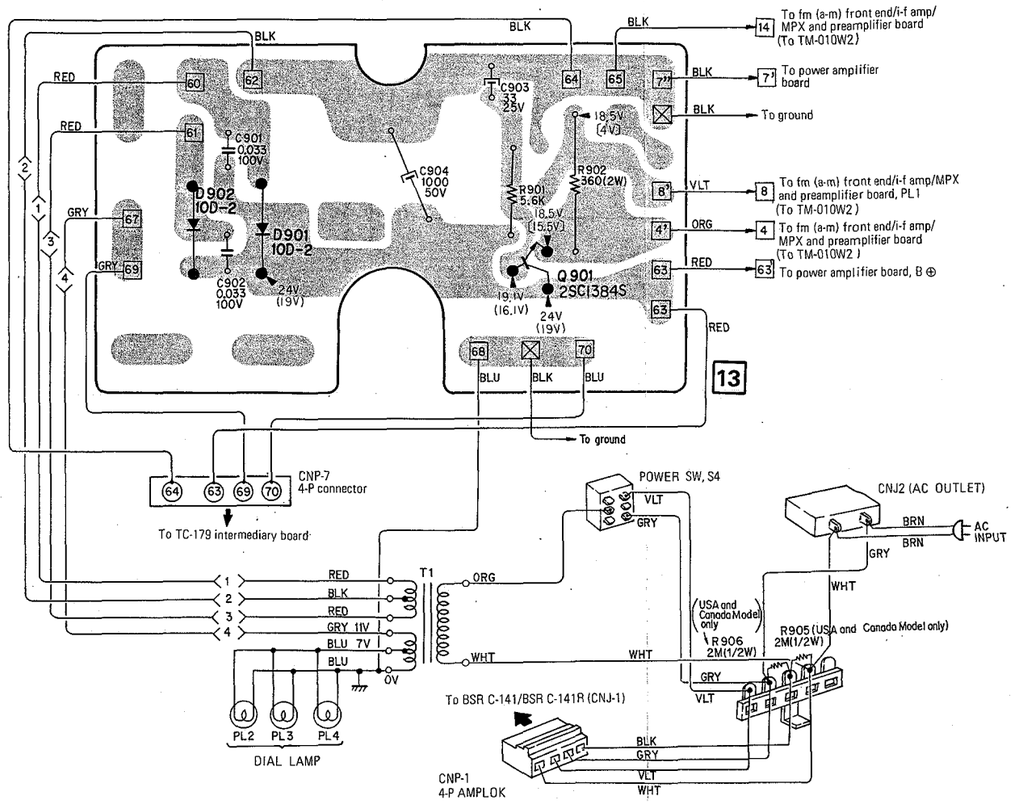


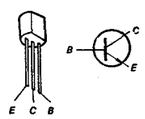
Fig. 5-1. Repacking

SECTION 6
DIAGRAMS

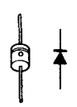
6-1. MOUNTING DIAGRAM — Power Supply Board —

— Conductor Side —





2SC1384S



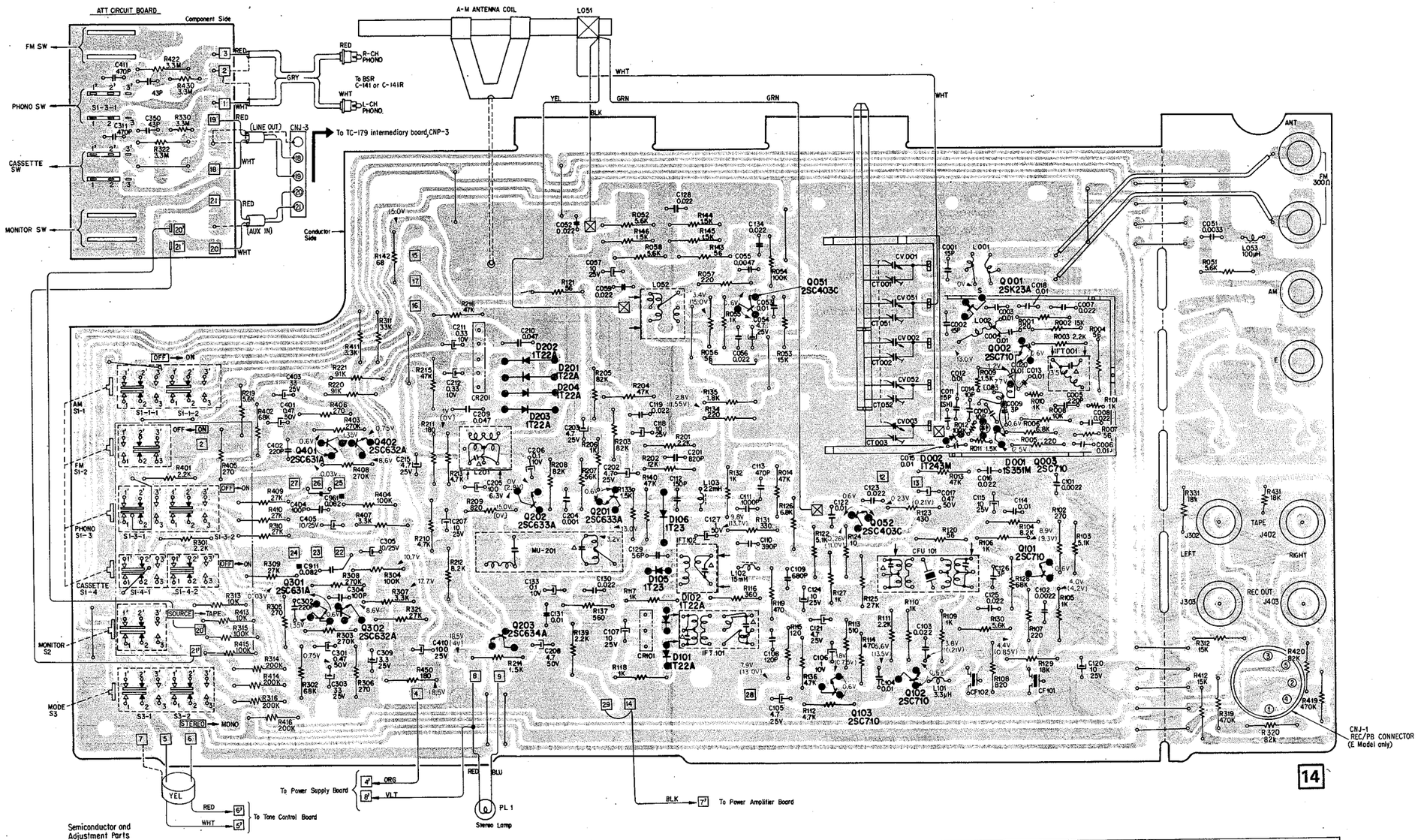
10D-2

Note: [ ] : STEREO operation
( ) : Measured at rated output

6-2. MOUNTING DIAGRAM

– Fm (A-m) Front End/I-f Amp/MPX and Preamplifier Board (TM-010W2)

– Conductor Side –



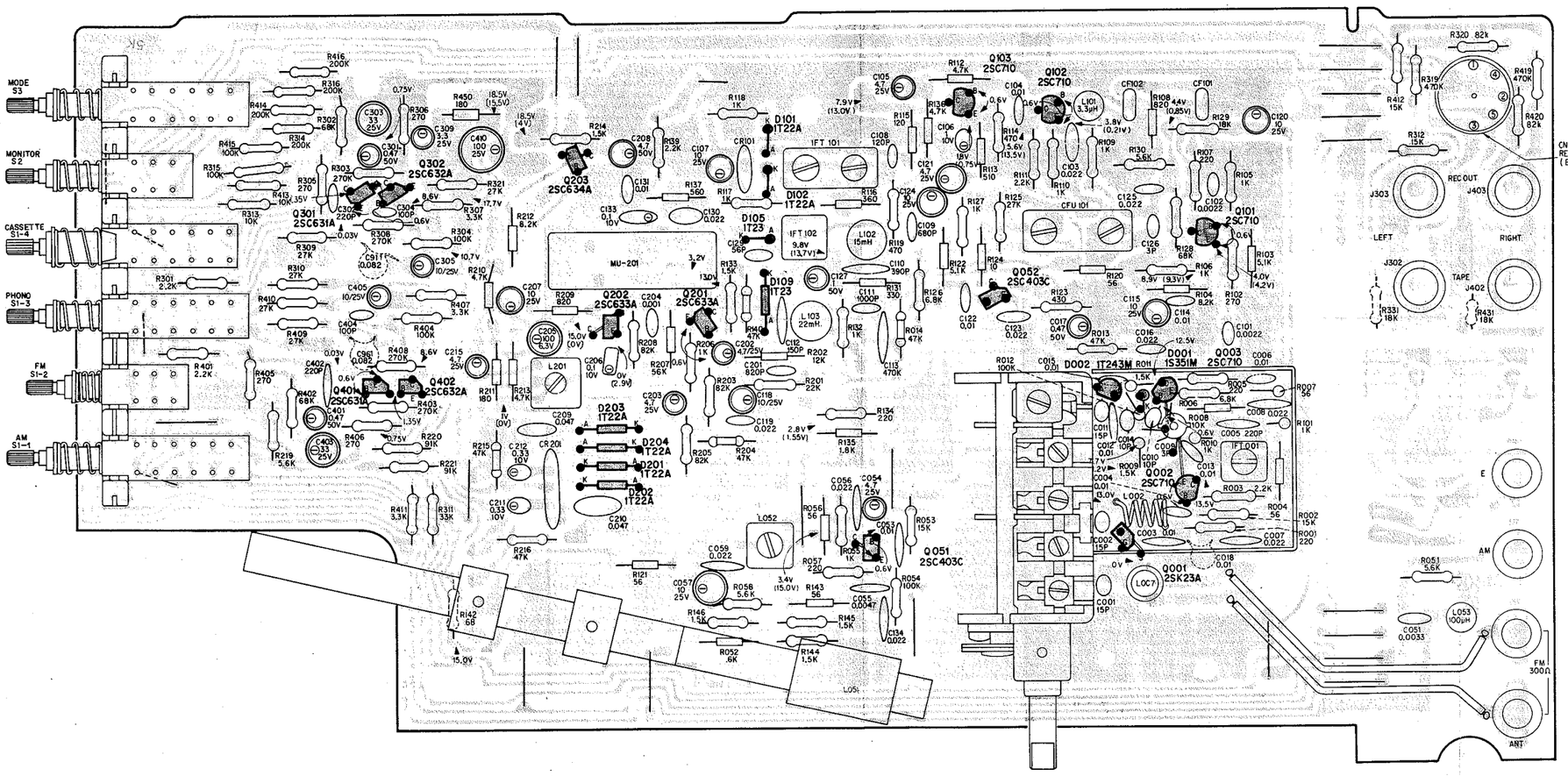
Semiconductor and Adjustment Parts Location

Q	Q401 Q402 Q301 Q302 Q202 Q203 Q201 Q051 Q052 Q103 Q102 Q001 Q002 Q003 Q101
D	D202, D201 D204, D203 D106, D102 D105, D101 D002 D001
ADJ	L051 L052 IFT101 CT001, CT051 L001 CT002, CT052, CT003 L002, L003 IFT001 L201

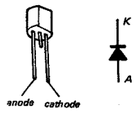
Note: C911(C961) are mounted on conductor side.
[ ] ; STEREO Operation
( ) ; A-M Operation

Note: [ ] shows the location of stencilled part number. Refer to this mark when replacing the part.

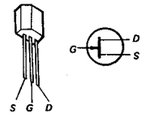
— Component Side —



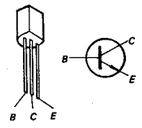
1S351M
1T22A
1T23



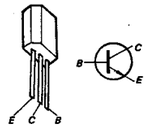
1T243M



2SK23A



2SC710

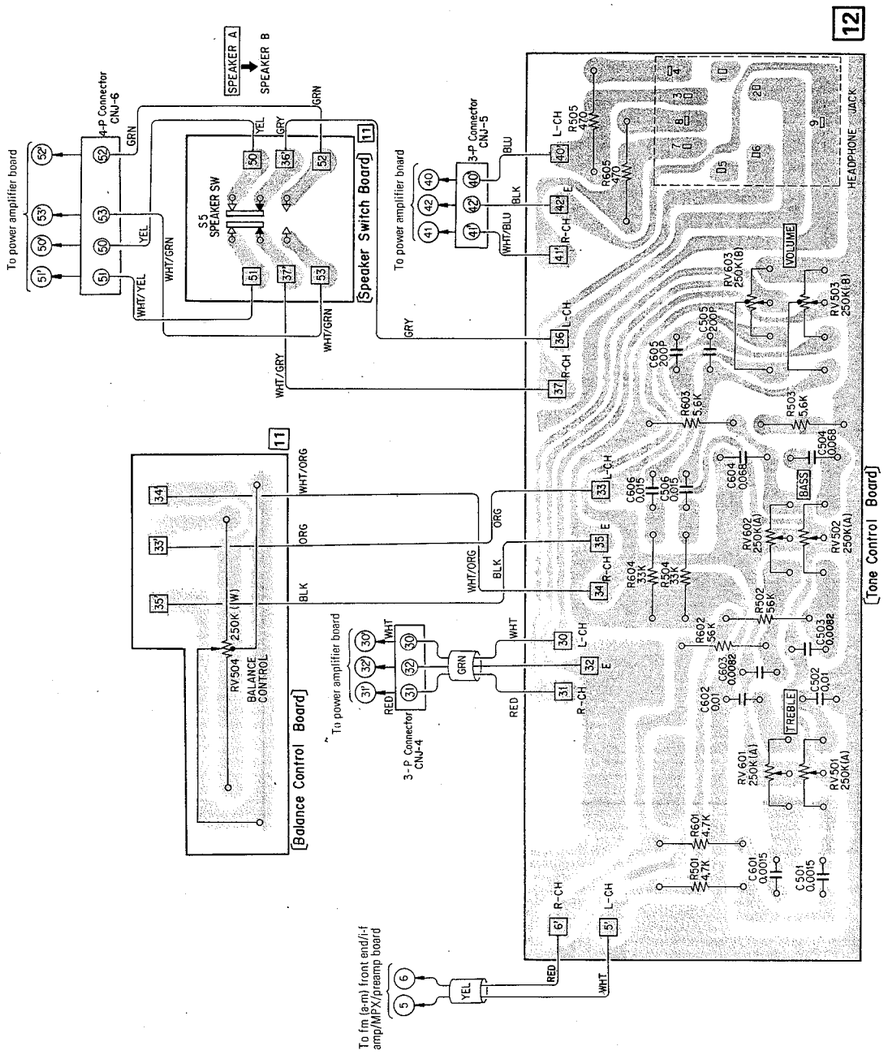


2SC631A
2SC632A
2SC633A
2SC634A

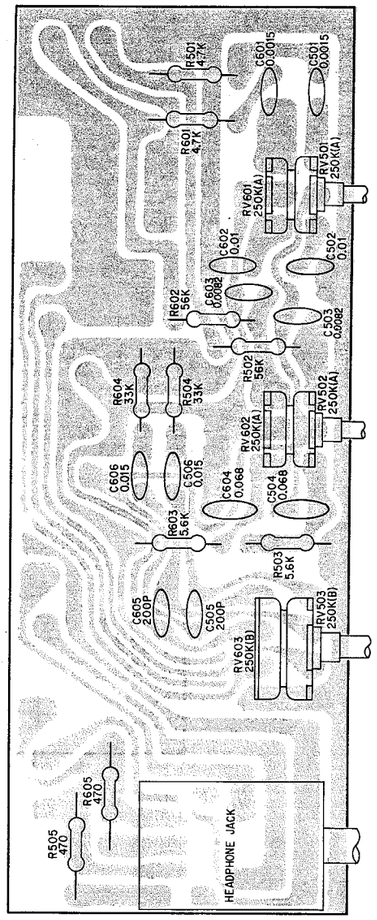
Note: [ ] : STEREO operation
( ) : A-M operation

6-3. MOUNTING DIAGRAM — Tone Control Board —

— Conductor Side —

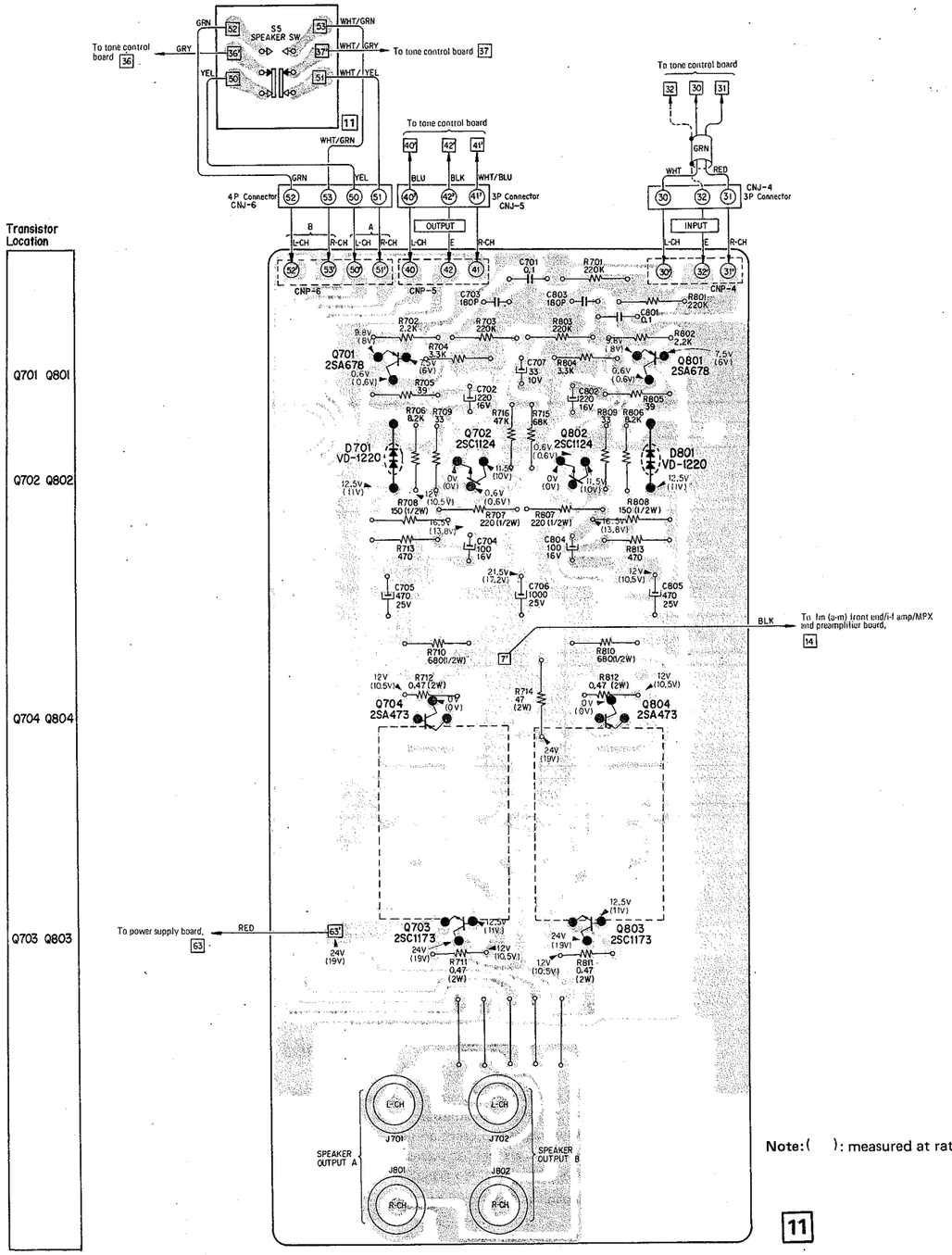


— Component Side —



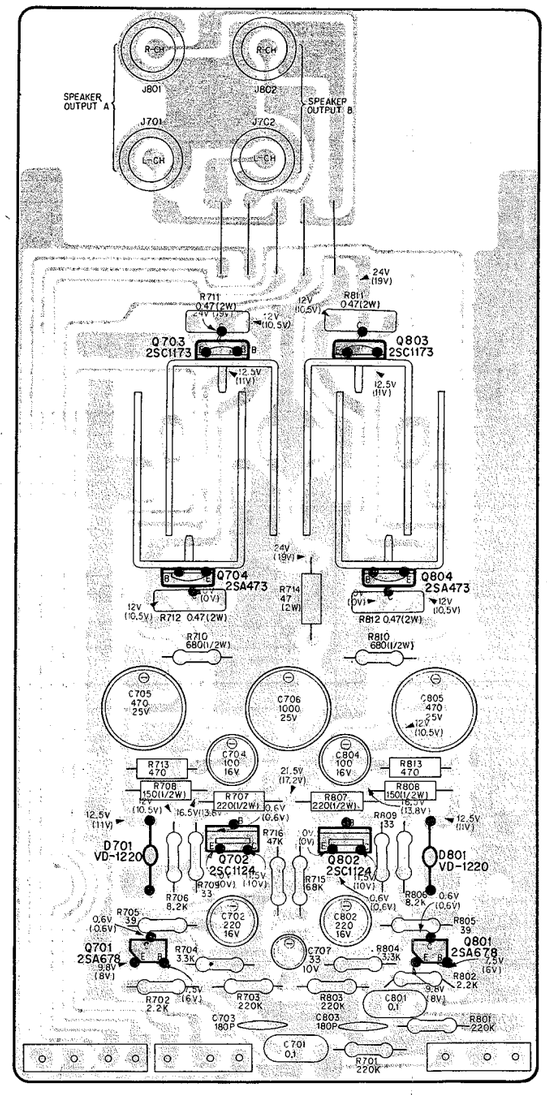
6-4. MOUNTING DIAGRAM – Power Amplifier Board (PM-011D)

– Conductor Side –

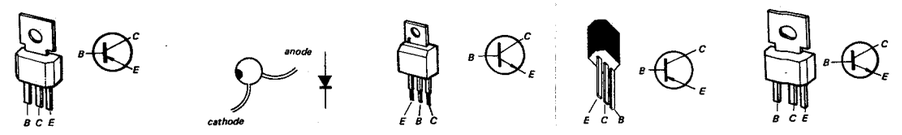


Note: ( ): measured at rated output

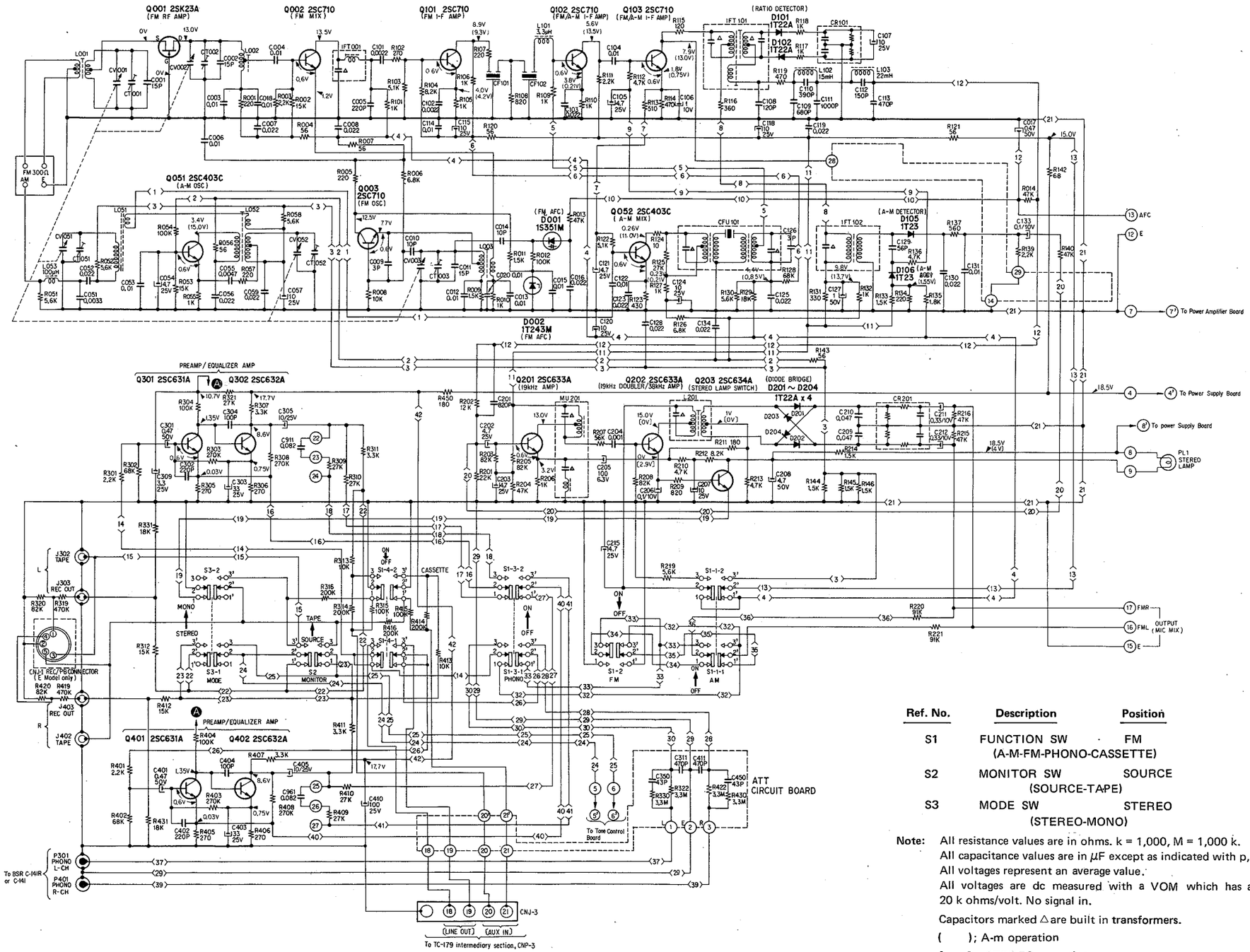
– Component Side –



Note: ( ): measured at rated output



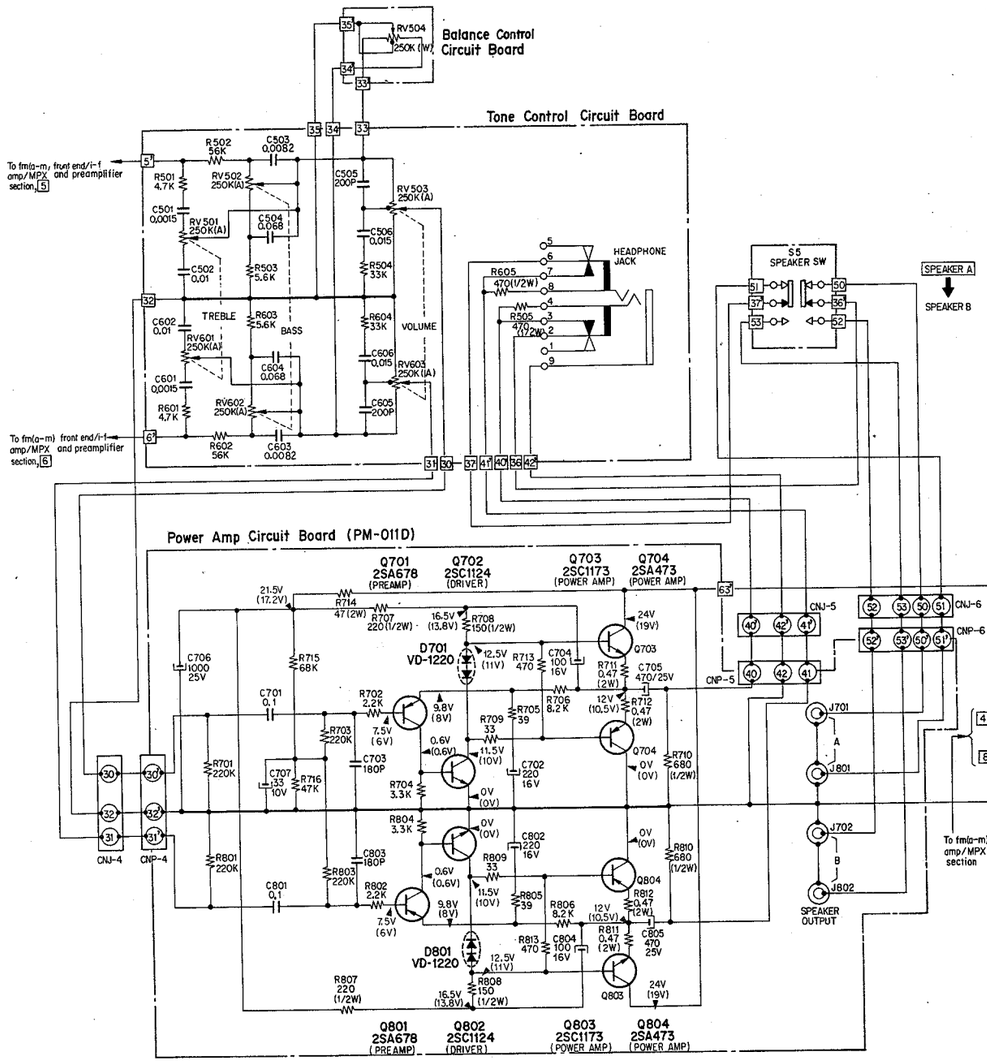
6-5. SCHEMATIC DIAGRAM — Fm (A-m) Front End/I-f Amp/MPX and Preamplifier Section —

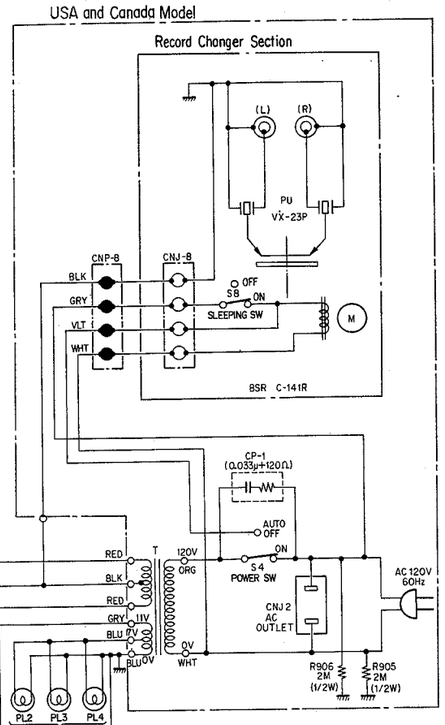


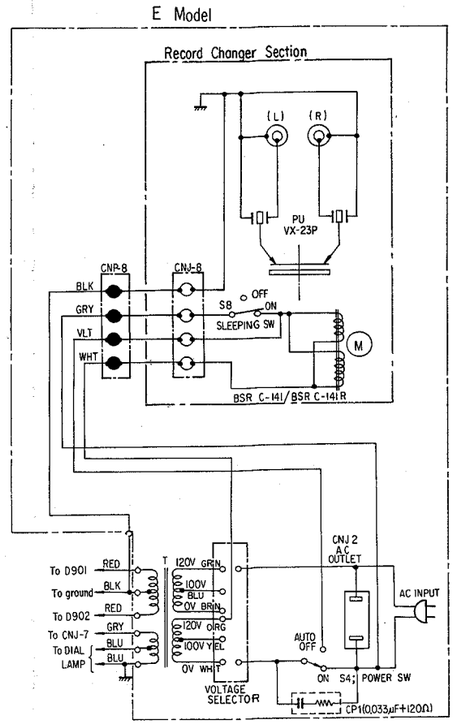
Ref. No.	Description	Position
S1	FUNCTION SW (A-M-FM-PHONO-CASSETTE)	FM
S2	MONITOR SW (SOURCE-TAPE)	SOURCE
S3	MODE SW (STEREO-MONO)	STEREO

Note: All resistance values are in ohms. k = 1,000, M = 1,000 k.
All capacitance values are in μF except as indicated with p, which means μμF.
All voltages represent an average value.
All voltages are dc measured with a VOM which has an input impedance of 20 k ohms/volt. No signal in.
Capacitors marked △ are built in transformers.
( ); A-m operation
[ ] : STEREO operation

6-6. SCHEMATIC DIAGRAM — Audio Amplifier Section —







Ref. No.	Description	Position
S4	POWER SW (ON-OFF)	ON
S5	SPEAKER SW (A-B)	A

Note:

All resistance values are in ohms. k = 1,000, M = 1,000 k.
All capacitance values are in μF except as indicated with p, which means μμF.
All voltages represent an average value.
All voltages are dc measured with a VOM which has an input impedance of 20 k ohms/volt. No signal in.

( ): measured at rated output
[ ]: STEREO operation

SECTION 7
EXPLODED VIEWS

(1)

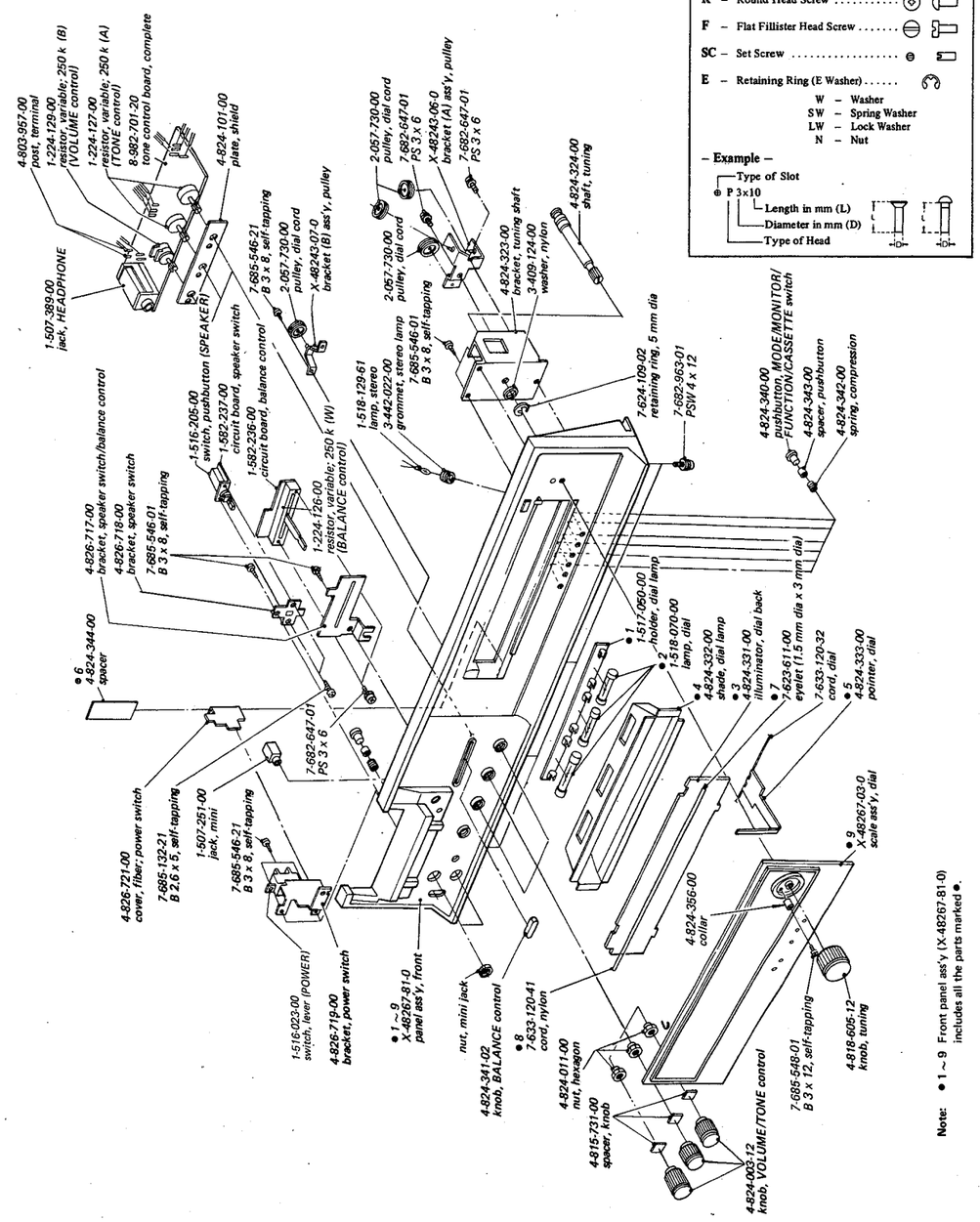
Note: All screws in this service manual are Phillips type (cross recess type) unless otherwise indicated. (–): slotted head.

– Hardware Nomenclature –

P	–	Pan Head Screw
PS	–	Pan Head Screw with Spring Washer
K	–	Flat Countersunk Head Screw
B	–	Binding Head Screw
RK	–	Oval Countersunk Head Screw
T	–	Truss Head Screw
R	–	Round Head Screw
F	–	Flat Fillister Head Screw
SC	–	Set Screw
E	–	Retaining Ring (E Washer)

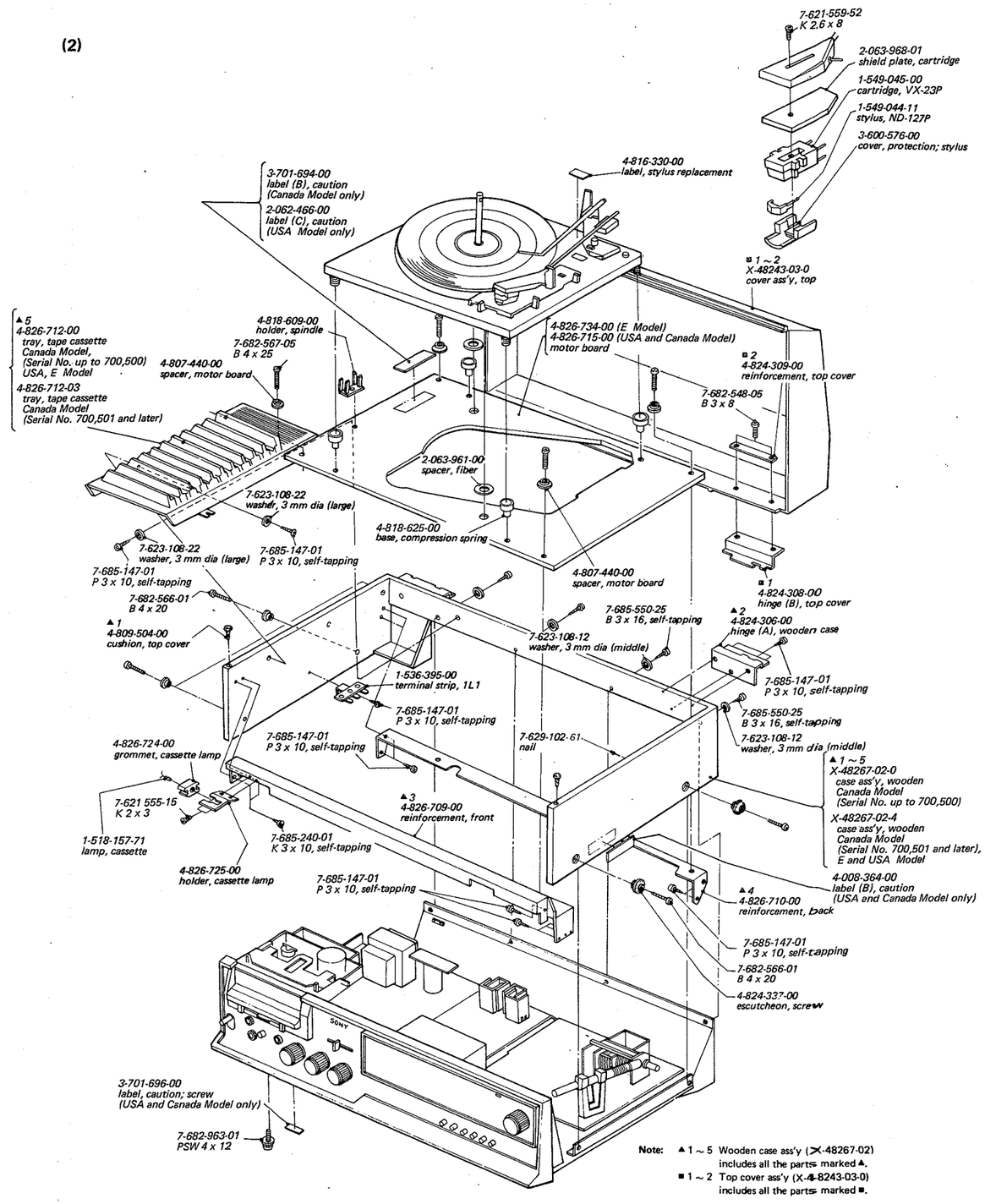
W – Washer
SW – Spring Washer
LW – Lock Washer
N – Nut

– Example –
Type of Slot
⊕ P 3×10
Length in mm (L)
Diameter in mm (D)
Type of Head

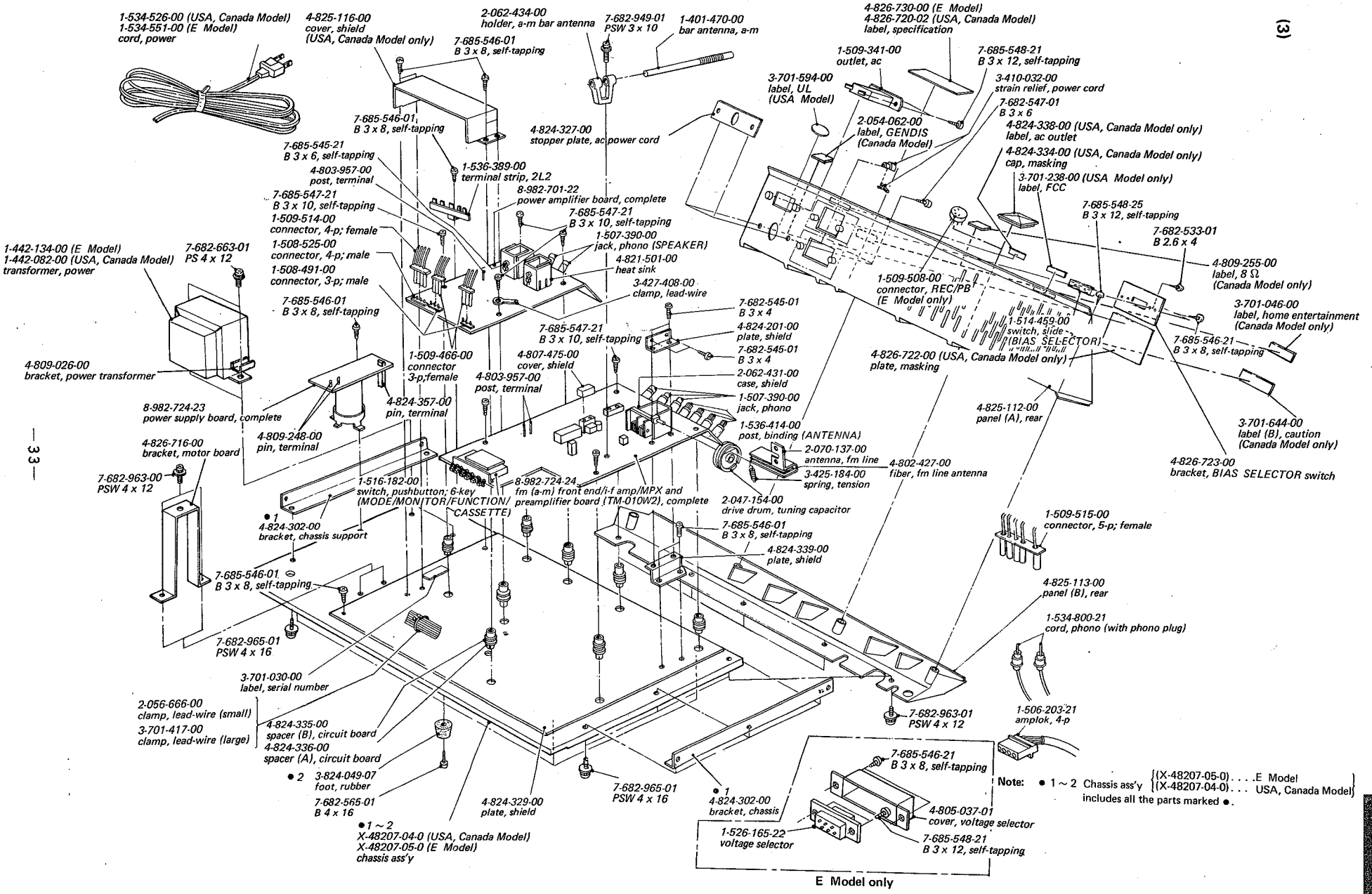

4-803-957-00 post, terminal
1-224-129-00 resistor, variable; 250 k (B) (VOLUME control)
1-224-127-00 resistor, variable; 250 k (A) (TONE control)
8-982-701-20 tone control board, complete
4-824-101-00 plate, shield
1-507-389-00 jack, HEADPHONE
7-685-546-21 B 3 x 8, self-tapping
2-057-730-00 pulley, dial cord
2-057-730-00 pulley, dial cord
X-48243-07-0 bracket (B) ass'y, pulley
7-682-647-01 PS 3 x 6
X-48243-06-0 bracket (A) ass'y, pulley
7-682-647-01 PS 3 x 6
4-824-324-00 shaft, tuning
4-824-323-00 bracket, tuning shaft
3-409-124-00 washer, nylon
7-624-109-02 retaining ring, 5 mm dia
7-682-963-01 PSW 4 x 12
4-824-340-00 pushbutton, MODE/MONITOR/ FUNCTION/CASSETTE switch
4-824-343-00 spacer, pushbutton
4-824-342-00 spring, compression
1-518-129-61 lamp, stereo
3-442-022-00 grommet, stereo lamp
7-685-546-01 B 3 x 8, self-tapping
1-516-205-00 switch, pushbutton (SPEAKER)
1-582-237-00 circuit board, speaker switch
1-582-236-00 circuit board, balance control
1-224-126-00 resistor, variable; 250 k (W) (BALANCE control)
4-826-717-00 bracket, speaker switch/balance control
4-826-718-00 bracket, speaker switch
7-685-546-01 B 3 x 8, self-tapping
4-824-344-00 spacer
7-682-647-01 PS 3 x 6
4-826-721-00 cover, fiber; power switch
7-685-132-21 B 2.6 x 5, self-tapping
1-507-251-00 jack, mini
7-685-546-21 B 3 x 8, self-tapping
1-516-023-00 switch, lever (POWER)
4-826-719-00 bracket, power switch
1-517-050-00 holder, dial lamp
1-518-070-00 lamp, dial
4-824-332-00 shade, dial lamp
4-824-331-00 illuminator, dial back
7-623-611-00 eyelet (1.5 mm dia x 3 mm dia)
7-633-120-32 cord, dial
4-824-333-00 pointer, dial
X-48267-03-0 scale ass'y, dial
4-824-356-00 collar
4-824-341-02 knob, BALANCE
7-633-120-41 cord, nylon
4-824-011-00 nut, hexagon
4-815-231-00 spacer, knob
4-824-003-12 knob, VOLUME/TONE control
7-685-548-01 B 3 x 12, self-tapping
4-818-605-12 knob, tuning
nut, mini jack
X-48267-81-0 panel ass'y, front

Note: ● 1 ~ 9 Front panel ass'y (X-48267-81-0) includes all the parts marked ●.

(2)


7-621-559-52 K 2.6 x 8
2-063-968-01 shield plate, cartridge
1-549-045-00 cartridge, VX-23P
1-549-044-11 stylus, ND-127P
3-600-576-00 cover, protection; stylus
4-816-330-00 label, stylus replacement
3-701-694-00 label (B), caution (Canada Model only)
2-062-466-00 label (C), caution (USA Model only)
■ 1 ~ 2 X-48243-03-0 cover ass'y, top
▲5 4-826-712-00 tray, tape cassette Canada Model, (Serial No. up to 700,500) USA, E Model
4-826-712-03 tray, tape cassette Canada Model (Serial No. 700,501 and later)
4-818-609-00 holder, spindle
7-682-567-05 B 4 x 25
4-807-440-00 spacer, motor board
4-826-734-00 (E Model) 4-826-715-00 (USA and Canada Model) motor board
■ 2 4-824-309-00 reinforcement, top cover
7-682-548-05 B 3 x 8
2-063-961-00 spacer, fiber
7-623-108-22 washer, 3 mm dia (large)
4-818-625-00 base, compression spring
7-623-108-22 washer, 3 mm dia (large)
7-685-147-01 P 3 x 10, self-tapping
7-685-147-01 P 3 x 10, self-tapping
4-807-440-00 spacer, motor board
■ 1 4-824-308-00 hinge (B), top cover
7-682-566-01 B 4 x 20
▲1 4-809-504-00 cushion, top cover
7-685-550-25 B 3 x 16, self-tapping
▲2 4-824-306-00 hinge (A), wooden case
7-623-108-12 washer, 3 mm dia (middle)
1-536-395-00 terminal strip, 1L1
7-685-147-01 P 3 x 10, self-tapping
7-685-147-01 P 3 x 10, self-tapping
7-685-550-25 B 3 x 16, self-tapping
7-623-108-12 washer, 3 mm dia (middle)
7-629-102-61 nail
▲1 ~ 5 X-48267-02-0 case ass'y, wooden Canada Model (Serial No. up to 700,500)
X-48267-02-4 case ass'y, wooden Canada Model (Serial No. 700,501 and later), E and USA Model
4-826-724-00 grommet, cassette lamp
7-621 555-15 K 2 x 3
1-518-157-71 lamp, cassette
▲3 4-826-709-00 reinforcement, front
7-685-240-01 K 3 x 10, self-tapping
4-826-725-00 holder, cassette lamp
4-008-364-00 label (B), caution (USA and Canada Model only)
▲4 4-826-710-00 reinforcement, back
7-685-147-01 P 3 x 10, self-tapping
7-682-566-01 B 4 x 20
4-824-337-00 escutcheon, screw
3-701-696-00 label, caution; screw (USA and Canada Model only)
7-682-963-01 PSW 4 x 12

Note: ▲1 ~ 5 Wooden case ass'y (X-48267-02) includes all the parts marked ▲.
■ 1 ~ 2 Top cover ass'y (X-48243-03-0) includes all the parts marked ■.



Note: ● 1 ~ 2 Chassis ass'y {(X-48207-05-0) . . . E Model / (X-48207-04-0) . . . USA, Canada Model} includes all the parts marked ●.

SECTION 8

ELECTRICAL PARTS LIST

Ref. No.	Part No.	Description
	COMPLETE CIRCUIT BOARDS	
	8-982-724-24	fm (a-m) front-end/i-f amp/MPX and preamplifier (TM-010W2)
	8-982-701-20	tone control
	8-982-701-22	power amplifier (PM-011D)
	8-982-724-23	power supply
	SEMICONDUCTORS	
D001		diode 1S351M
D002		diode 1T243M
D101		diode 1T22A
D102		diode 1T22A
D105		diode 1T23
D106		diode 1T23
D201		diode 1T22A
D202		diode 1T22A
D203		diode 1T22A
D204		diode 1T22A
D701(D801)		diode VD-1220
D901		diode 10D-2
D902		diode 10D-2
Q001		transistor 2SK23A
Q002		transistor 2SC710
Q003		transistor 2SC710
Q051		transistor 2SC403C
Q052		transistor 2SC403C
Q101		transistor 2SC710
Q102		transistor 2SC710
Q103		transistor 2SC710
Q201		transistor 2SC633A
Q202		transistor 2SC633A
Q203		transistor 2SC634A
Q301(Q401)		transistor 2SC631A
Q302(Q402)		transistor 2SC632A
Q701(Q801)		transistor 2SA678
Q702(Q802)		transistor 2SC1124
Q703(Q803)		transistor 2SC1173
Q704(Q804)		transistor 2SA473
Q901		transistor 2SC1384S

Ref. No.	Part No.	Description
	TRANSFORMERS, COILS AND INDUCTORS	
CFU101	1-403-150-00	CFU, 455 kHz
IFT001	1-403-821-00	IFT, 10.7 MHz
IFT101	1-403-822-00	transformer, discriminator
IFT102	1-403-820-00	IFT, 455 kHz
L001	1-401-471-00	coil, fm antenna
L002	1-425-547-00	coil, fm rf
L003	1-405-434-00	coil, fm osc
L051	1-401-470-00	bar antenna, a-m
L052	1-405-486-00	coil, a-m osc
L053	1-407-169-00	inductor, micro 100 μH
L101	1-407-184-00	inductor, micro 3.3 μH
L102	1-407-585-12	inductor, micro 15 mH
L103	1-407-560-00	inductor, micro 22 mH
L201	1-425-688-00	transformer, switching
MU201	1-425-687-00	MPX unit
T901	1-442-082-00	transformer, power (USA and Canada Model)
	1-442-134-00	transformer, power (E Model)

CAPACITORS

All capacitance values are in μF except as indicated with p, which means μμF.

C001	1-102-951-11	15 p	±5 %	50 V	ceramic
C002	1-102-951-11	15 p	±5 %	50 V	ceramic
C003	1-101-118-11	0.01	±20 %	50 V	ceramic
C004	1-101-923-11	0.01	+80 −20 %	25 V	ceramic
C005	1-102-978-11	220 p	±5 %	50 V	ceramic
C006	1-101-923-11	0.01	+80 −20 %	25 V	ceramic
C007	1-101-924-11	0.022	+80 −20 %	25 V	ceramic
C008	1-101-924-11	0.022	+80 −20 %	25 V	ceramic
C009	1-102-862-11	3 p	±0.25 pF	50 V	ceramic
C010	1-102-947-11	10 p	±5 %	50 V	ceramic
C011	1-101-971-11	15 p	±5 %	50 V	ceramic
C012	1-101-118-11	0.01	±20 %	50 V	ceramic
C013	1-101-923-11	0.01	+80 −20 %	25 V	ceramic
C014	1-102-947-11	10 p	±5 %	50 V	ceramic
C015	1-101-923-11	0.01	+80 −20 %	25 V	ceramic
C016	1-101-924-11	0.022	+80 −20 %	25 V	ceramic
C017	1-121-726-11	0.47		50 V	electrolytic
C018	1-101-118-11	0.01	±20 %	50 V	ceramic
C020	1-101-925-11	0.01	+80 −20 %	50 V	ceramic
C051	1-105-667-12	0.0033	±10 %	50 V	mylar
C052	1-101-924-11	0.022	+80 −20 %	25 V	ceramic
C053	1-101-923-11	0.01	+80 −20 %	25 V	ceramic
C054	1-121-395-11	4.7		25 V	electrolytic
C055	1-105-669-12	0.0047	±10 %	50 V	mylar
C056	1-101-924-11	0.022	+80 −20 %	25 V	ceramic
C057	1-121-398-11	10		25 V	electrolytic
C058		----------			
C059	1-101-924-11	0.022	+80 −20 %	25 V	ceramic

Ref. No.	Part No.	Description			
C101	1-101-919-11	0.0022	$^{+80}_{-20}$ %	25 V	ceramic
C102	1-105-665-12	0.0022	±10 %	50 V	mylar
C103	1-105-677-12	0.022	±10 %	50 V	mylar
C104	1-101-923-11	0.01	$^{+80}_{-20}$ %	25 V	ceramic
C105	1-121-395-11	4.7		25 V	electrolytic
C106	1-127-023-11	1		10 V	solid aluminum
C107	1-121-398-11	10		25 V	electrolytic
C108	1-101-340-11	120 p	±10 %	50 V	ceramic
C109	1-102-116-11	680 p	±10 %	50 V	ceramic
C110	1-102-822-11	390 p	±5 %	50 V	ceramic
C111	1-102-074-11	1,000 p	±10 %	50 V	ceramic
C112	1-101-361-11	150 p	±5 %	50 V	ceramic
C113	1-102-824-11	470 p	±5 %	50 V	ceramic
C114	1-101-923-11	0.01	$^{+80}_{-20}$ %	25 V	ceramic
C115	1-121-398-11	10		25 V	electrolytic
C116		----------			
C117		----------			
C118	1-121-398-11	10		25 V	electrolytic
C119	1-101-924-11	0.022	$^{+80}_{-20}$ %	25 V	ceramic
C120	1-121-398-11	10		25 V	electrolytic
C121	1-121-395-11	4.7		25 V	electrolytic
C122	1-101-923-11	0.01	$^{+80}_{-20}$ %	25 V	ceramic
C123	1-105-677-12	0.022	±10 %	50 V	mylar
C124	1-121-398-11	10		25 V	electrolytic
C125	1-101-924-11	0.022	$^{+80}_{-20}$ %	25 V	ceramic
C126	1-102-940-11	3 p	±5 %	50 V	ceramic
C127	1-121-391-11	1		50 V	electrolytic
C128	1-101-924-11	0.022	$^{+80}_{-20}$ %	25 V	ceramic
C129	1-101-884-11	56 p	±5 %	50 V	ceramic
C130	1-105-677-12	0.022	±10 %	50 V	mylar
C131	1-105-673-12	0.01	±10 %	50 V	mylar
C132		----------			
C133	1-127-019-11	0.1		10 V	solid aluminum
C134	1-101-924-11	0.022	$^{+80}_{-20}$ %	25 V	ceramic
C201	1-102-117-11	820 p	±10 %	50 V	ceramic
C202	1-121-395-11	4.7		25 V	electrolytic
C203	1-121-395-11	4.7		25 V	electrolytic
C204	1-105-661-12	0.001	±10 %	50 V	mylar
C205	1-121-413-11	100		6.3 V	electrolytic
C206	1-127-019-11	0.1		10 V	solid aluminum
C207	1-121-398-11	10		25 V	electrolytic
C208	1-121-396-11	4.7		50 V	electrolytic
C209	1-105-681-12	0.047	±10 %	50 V	mylar
C210	1-105-681-12	0.047	±10 %	50 V	mylar
C211	1-127-021-11	0.33		10 V	solid aluminum
C212	1-127-021-11	0.33		10 V	solid aluminum
C213		----------			
C214		----------			
C215	1-121-395-11	4.7		25 V	electrolytic
C301(C401)	1-121-726-11	0.47		50 V	electrolytic
C302(C402)	1-102-983-11	220 p	±10 %	50 V	ceramic

Ref. No.	Part No.	Description			
C303(C403)	1-121-404-11	33		25 V	electrolytic
C304(C404)	1-102-975-11	100 p	±10 %	50 V	ceramic
C305(C405)	1-121-398-11	10		25 V	electrolytic
C309	1-121-392-11	3.3		25 V	electrolytic
(C410)	1-121-416-11	100		25 V	electrolytic
C311(C411)	1-102-114-11	470 p	±5 %	50 V	ceramic
C350(C450)	1-102-966-11	43 p	±5 %	50 V	ceramic
C501(C601)	1-106-062-12	0.0015	±10 %	50 V	mylar
C502(C602)	1-106-082-12	0.01	±10 %	50 V	mylar
C503(C603)	1-106-080-12	0.0082	±10 %	50 V	mylar
C504(C604)	1-106-102-12	0.068	±10 %	50 V	mylar
C505(C605)	1-102-977-11	200 p	±5 %	50 V	ceramic
C506(C606)	1-106-086-12	0.015	±10 %	50 V	mylar
C701(C801)	1-105-685-12	0.1	±10 %	50 V	mylar
C702(C802)	1-121-421-11	220		16 V	electrolytic
C703(C803)	1-102-976-11	180 p	±5 %	50 V	ceramic
C704(C804)	1-121-415-11	100		16 V	electrolytic
C705(C805)	1-121-733-11	470		25 V	electrolytic
C706	1-121-657-11	1,000		25 V	electrolytic
C707	1-121-402-11	33		10 V	electrolytic
C901	1-105-879-12	0.033	±20 %	100 V	mylar
C902	1-105-879-12	0.033	±20 %	100 V	mylar
C903	1-121-404-11	33		25 V	electrolytic
C904	1-125-081-11	1,000		50 V	electrolytic
C911(C961)	1-105-684-12	0.082	±10 %	50 V	mylar
CT001,002 003,051,052 CV001,002 003,051,052	1-151-235-00	capacitor, tuning			

RESISTORS

All resistance values are in Ω, ±5 %, ¼ W and carbon type unless otherwise indicated.

Ref. No.	Part No.			
R001	1-244-657-11	220		
R002	1-244-701-11	15 k		
R003	1-244-681-11	2.2 k		
R004	1-202-343-11	56	¼ W	composition
R005	1-244-657-11	220		
R006	1-244-693-11	6.8 k		
R007	1-202-343-11	56	¼ W	composition
R008	1-202-407-11	10 k	¼ W	composition
R009	1-202-387-11	1.5 k	¼ W	composition
R010	1-202-383-11	1 k	¼ W	composition
R011	1-202-387-11	1.5 k	¼ W	composition
R012	1-202-431-11	100 k	¼ W	composition
R013	1-244-713-11	47 k		
R014	1-244-713-11	47 k		

Ref. No.	Part No.			
R051	1-244-691-11	5.6 k		
R052	1-244-691-11	5.6 k		
R053	1-244-701-11	15 k		
R054	1-244-721-11	100 k		
R055	1-244-673-11	1 k		
R056	1-202-343-11	56	¼ W	composition
R057	1-244-657-11	220		
R058	1-244-691-11	5.6 k		
R101	1-202-383-11	1 k	¼ W	composition
R102	1-244-659-11	270		
R103	1-202-400-11	5.1 k	¼ W	composition
R104	1-202-405-11	8.2 k	¼ W	composition
R105	1-244-673-11	1 k		
R106	1-244-673-11	1 k		
R107	1-244-657-11	220		
R108	1-202-381-11	820	¼ W	composition
R109	1-244-673-11	1 k		
R110	1-244-673-11	1 k		
R111	1-244-681-11	2.2 k		
R112	1-202-399-11	4.7 k	¼ W	composition
R113	1-202-376-11	510	¼ W	composition
R114	1-244-665-11	470		
R115	1-202-361-11	120	¼ W	composition
R116	1-202-372-11	360	¼ W	composition
R117	1-244-673-11	1 k		
R118	1-244-673-11	1 k		
R119	1-244-665-11	470		
R120	1-202-343-11	56	¼ W	composition
R121	1-202-343-11	56	¼ W	composition
R122	1-202-400-11	5.1 k	¼ W	composition
R123	1-244-664-11	430		
R124	1-202-325-11	10	¼ W	composition
R125	1-244-707-11	27 k		
R126	1-244-693-11	6.8 k		
R127	1-244-673-11	1 k		
R128	1-244-717-11	68 k		
R129	1-244-703-11	18 k		
R130	1-244-691-11	5.6 k		
R131	1-202-371-11	330	¼ W	composition
R132	1-244-673-11	1 k		
R133	1-244-677-11	1.5 k		
R134	1-244-657-11	220		
R135	1-202-389-11	1.8 k	¼ W	composition
R136	1-202-399-11	4.7 k	¼ W	composition
R137	1-202-377-11	560	¼ W	composition
R138		----------		
R139	1-244-681-11	2.2 k		
R140	1-244-713-11	47 k		
R141		----------		
R142	1-202-355-11	68	¼ W	composition
R143	1-202-343-11	56	¼ W	composition
R144	1-244-677-11	1.5 k		

Ref. No.	Part No.			
R145	1-244-677-11	1.5 k		
R146	1-244-677-11	1.5 k		
R201	1-244-705-11	22 k		
R202	1-202-409-11	12 k	¼ W	composition
R203	1-244-719-11	82 k		
R204	1-244-713-11	47 k		
R205	1-244-719-11	82 k		
R206	1-244-673-11	1 k		
R207	1-202-425-11	56 k	¼ W	composition
R208	1-244-719-11	82 k		
R209	1-202-381-11	820	¼ W	composition
R210	1-202-399-11	4.7 k	¼ W	composition
R211	1-202-365-11	180	¼ W	composition
R212	1-202-405-11	8.2 k	¼ W	composition
R213	1-202-399-11	4.7 k	¼ W	composition
R214	1-244-677-11	1.5 k		
R215	1-244-713-11	47 k		
R216	1-244-713-11	47 k		
R219	1-244-691-11	5.6 k		
R220	1-202-433-11	91 k		
R221	1-202-433-11	91 k		
R301(R401)	1-244-681-11	2.2 k		
R302(R402)	1-244-717-11	68 k		
R303(R403)	1-244-731-11	270 k		
R304(R404)	1-244-721-11	100 k		
R305(R405)	1-244-659-11	270		
R306(R406)	1-244-659-11	270		
R307(R407)	1-244-685-11	3.3 k		
R308(R408)	1-244-731-11	270 k		
R309(R409)	1-244-707-11	27 k		
R310(R410)	1-244-707-11	27 k		
R311(R411)	1-244-685-11	3.3 k		
R312(R412)	1-244-701-11	15 k		
R313(R413)	1-244-697-11	10 k		
R314(R414)	1-244-728-11	200 k		
R315(R415)	1-244-721-11	100 k		
R316(R416)	1-244-728-11	200 k		
R317(R417)		----------		
R318(R418)		----------		
R319(R419)	1-202-637-11	470 k	¼ W	composition
R320(R420)	1-244-719-11	82 k		
R321	1-244-707-11	27 k		
R322(R422)	1-202-467-11	3.3 M	¼ W	composition
R330(R430)	1-202-467-11	3.3 M	¼ W	composition
R331(R431)	1-244-703-11	18 k		
(R450)	1-202-365-11	180	¼ W	composition
R501(R601)	1-244-689-11	4.7 k		
R502(R602)	1-244-715-11	56 k		
R503(R603)	1-244-691-11	5.6 k		
R504(R604)	1-244-709-11	33 k		

Ref. No.	Part No.	Description
R505(R605)	1-202-565-11	470 ½ W composition
R701(R801)	1-244-729-11	220 k
R702(R802)	1-202-391-11	2.2 k ¼ W composition
R703(R803)	1-244-729-11	220 k
R704(R804)	1-202-395-11	3.3 k ¼ W composition
R705(R805)	1-202-339-11	39 ¼ W composition
R706(R806)	1-244-695-11	8.2 k
R707(R807)	1-202-557-11	220 ½ W composition
R708(R808)	1-202-553-11	150 ½ W composition
R709(R809)	1-202-337-11	33 ¼ W composition
R710(R810)	1-202-379-11	680 ¼ W composition
R711(R811)	1-217-153-11	0.47 2 W metal-oxide
R712(R812)	1-217-153-11	0.47 2 W metal-oxide
R713(R813)	1-202-375-11	470 ¼ W composition
R714	1-206-122-11	47 2 W metal-oxide
R715	1-202-427-11	68 k ¼ W composition
R716	1-202-423-11	47 k ¼ W composition
R901	1-244-691-11	5.6 k
R902	1-206-653-11	360 2 W metal-oxide
R905	1-202-652-11	2 M ½ W composition (USA and Canada Model only)
R906	1-202-652-11	2 M ½ W composition (USA and Canada Model only)
RV501 (RV601)	1-224-127-00	250 k (A), variable (TREBLE)
RV502 (RV602)	1-224-127-00	250 k (A), variable (BASS)
RV503 (RV603)	1-224-129-00	250 k (B), variable (VOLUME)
RV504	1-224-126-00	250 k (W), variable (BALANCE)

SWITCHES

S1,2,3	1-516-182-00	pushbutton; 6-key (FUNCTION, MODE, CASSETTE, MONITOR)
S4	1-516-023-00	lever (POWER)
S5	1-516-205-00	pushbutton (SPEAKER)

FILTERS

CF101,102	1-403-562-11	fm i-f, ceramic; 10.70 MHz (red)
	1-403-562-31	fm i-f, ceramic; 10.74 MHz (white)
	1-403-562-51	fm i-f, ceramic; 10.78 MHz (yellow)

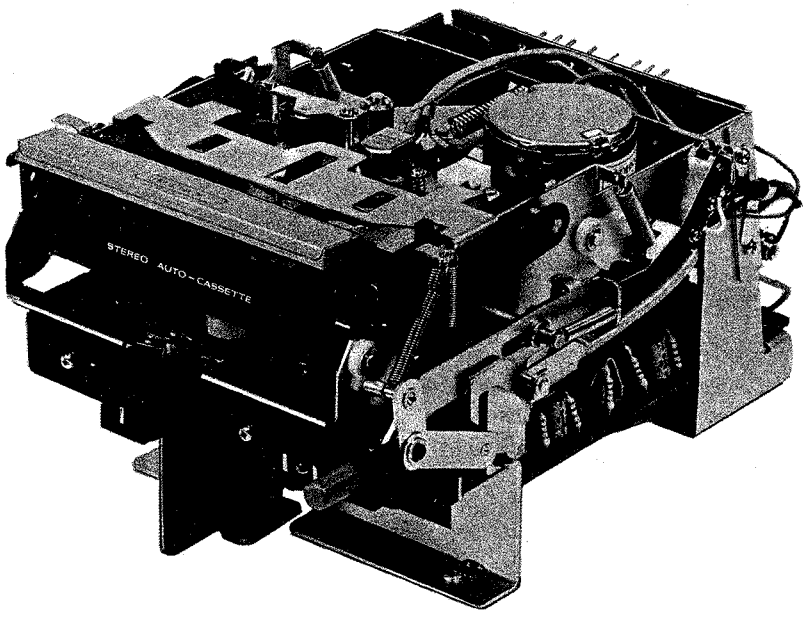
Ref. No.	Part No.	Description

MISCELLANEOUS

CP1	1-231-057-12	encapsulated component, 0.033 μF + 120 Ω
CR101	1-231-175-00	encapsulated component
CR201	1-231-225-00	encapsulated component
CNJ1	1-509-508-00	connector, REC/PB (E Model only)
CNJ2	1-509-341-00	outlet, ac
CNP8	1-506-203-21	amplok, 4-p
J701(J801), J702(J802)	1-507-390-00	jack, phono
CNP-4, CNP-5	1-508-491-00	connector, 3-p; male
CNP-6	1-508-525-00	connector, 4-p; male
	1-508-529-00	connector, 5-p; male
J302(J402)	1-507-390-00	jack, phono; TAPE
J303(J403)	1-507-390-00	jack, phono; REC OUT
	1-507-389-00	jack, HEADPHONE
CNJ-4,CNJ-5	1-509-466-00	connector, 3-p; female
CNJ-6,CNJ-7	1-509-514-00	connector, 4-p; female
CNJ-3	1-509-515-00	connector, 5-p; female
PL1	1-518-129-61	lamp, stereo 4.5 V/40 mA
PL2,3,4	1-518-070-00	lamp, dial 8 V/0.3 A
	1-517-050-00	holder, dial lamp
	1-534-526-00	cord, power (USA and Canada Model)
	1-534-551-00	cord, power (E Model)
	1-534-800-21	cord, phono (with phono plug)
	1-536-389-00	terminal strip, 2L2
	1-536-395-00	terminal strip, 1L1
	1-536-414-00	binding post (ANTENNA)
	1-549-044-11	stylus, ND-127P
PU	1-549-045-00	cartridge, VX-23P
	1-582-236-00	printed circuit board, BALANCE control
	1-582-237-00	printed circuit board, SPEAKER switch
VS	1-526-165-22	voltage selector (E Model only)

MEMO

STEREO CASSETTE DECK
〔TC-179〕



Note: TC-179 is a stereo cassette deck installed in HP-179A.

SONY®
SERVICE MANUAL

TABLE OF CONTENTS

Section	*Title*	*Page*
1.	**TECHNICAL DESCRIPTION**	
1-1.	Specifications	41
1-2.	Circuit Description	41
1-3.	Principles of Shut-off Mechanism	42
1-4.	Block Diagram	44
1-5.	Level Diagram	45
2.	**DISASSEMBLY AND REPLACEMENT**	
2-1.	Cassette Deck Removal	46
2-2.	REC/PB Amplifier Board Removal	46
2-3.	Chassis Layout	47
3.	**MECHANICAL ADJUSTMENTS**	
3-1.	Tools Required	48
3-2.	Flywheel END-PLAY Adjustment	48
3-3.	Loading Button Play Adjustment	48
3-4.	Motor Pulley Height Adjustment	49
3-5.	Take-Up and FF/REW Tension Checkout	49
3-6.	Pinch Roller Pressure Check	50
4.	**ELECTRICAL ADJUSTMENTS**	
4-1.	Test Equipment and Tools Required	51
4-2.	Tape Speed Adjustment	51
4-3.	Head Azimuth Adjustment	52
4-4.	Playback Level Adjustment	52
4-5.	Record Bias Adjustment	52
4-6.	AGC Balance Adjustment	53
5.	**DIAGRAMS**	
5-1.	Mounting Diagram – Intermediary Board –	55
5-2.	Mounting Diagram – REC/PB Amplifier Board –	56
5-3.	Schematic Diagram – Stereo Cassette Deck Section –	57
6.	**EXPLODED VIEWS**	58
7.	**ELECTRICAL PARTS LIST**	62

CAUTION

Always connect the main chassis with the cassette deck chassis electrically to provide a ground return when performing an operational check or electrical adjustment.

SECTION 1
TECHNICAL DESCRIPTION

1-1. SPECIFICATIONS

Tape speed:	4.8 cm/sec ($1^7/_8$ inch/sec)
Frequency response:	40 Hz to 10 kHz (−15 dB)
Recording and erasing bias frequency:	85 kHz
Motor:	D-015G
Input:	MIC: 0.775 mV (−60 dB), 220 ohms AUX: 60 mV (−22 dB), 20 kohms
Output:	LINE: 920 mV (+ 1.5 dB)
Wow and flutter:	Less than 0.3 % (RMS)

1-2. CIRCUIT DESCRIPTION

The following text describes the function or operation of all stages and controls. The text sequence follows signal paths. Stages are listed by transistor reference designation at the left margin; major components are also listed in a similar manner. Refer to the block diagram on page 44 and the schematic diagram on page 57.

Since the REC/PB amplifier section contains two identical amplifier chains, only the left channel will be described. The right channel is identical except for reference numbers.

Stage/Control	*Function*
Preamplifier Q101, Q102	This stage has two functions. One is a flat amplifier for recording, the other is a NAB equalizer for playback. The changeover operation is performed by REC/PB switch S11.
REC/PB switch S11	In the playback mode, the voltage induced in the playback head is applied to the base of Q101 through S11-2, and then amplified to the level required for the following flat amplifier Q102. Playback equalization is achieved by means of a negative feedback loop containing C111, R112 and R111. RV202 (R-CH) varies the overall gain of the preamplifier, to compensate for left and right channel difference. In the record mode, this amplifier acts as a flat amplifier, because the negative feedback loop is changed by means of S11-3. In this case the negative feedback loop is changed to R115 and C106.
AGC circuit	Notice that the agc circuit, which is effective only at record mode due to S11-5, is provided at the interstage of Q101 and Q102. This will be described later.
Flat/record amplifier Q104, Q105	This is basically a conventional RC coupled amplifier which delivers signals required at the control amplifier or record head. This also acts as a buffer amplifier between the control amplifier and tape deck. It has a gain of 36 dB.
AGC circuit	The automatic gain control circuit employed is essentially a compressor to prevent overmodulation in the recording system. Although agc restricts the volume range to some extent, it aids in flattening out excessive program peaks. Agc operation is achieved by changing the gain of preamplifier Q101, Q102 by varying the impedance between collector and emitter of Q103. The agc circuit works as follows: In the record mode, output signal from the preamplifier is fed to the voltage doubler (D101, D102) through the flat amplifier.
Agc voltage doubler D101, D102	The signal is rectified by voltage doubler rectifier D101 and D102, and then supplied to the base of Q301. Notice that the left and right channel agc voltage are added at the base of Q301.

Stage/Control	*Function*
Dc amplifier Q301	Q301 is a dc amplifier which amplifies the dc component of the rectified signal (which is proportional to the input signal level) to the level required to drive control transistor Q103 (Q203).
Q103, (Q203)	The dc output of Q301 is applied to the base of the control transistor (which acts as shunt resistor between Q101 and Q102) through adjustable resistor RV301 (agc balance adj.). RV301 balances the agc response between "L" and "R" channels. The base current of Q103 (Q203) determines the impedance between the collector and emitter of Q103 (Q203), which in turn determines the input impedance of Q102 and hence the preamplifier gain.
Bias current trap L101, C121	Prevents bias current leak in the record amplifier. This trap is a parallel-tuned circuit.
Bias oscillator unit	This oscillator unit supplies bias current to the record head through coupling capacitors. The circuit is a Hartley oscillator with the feedback applied to the base from the collector circuit.
Bias selector SW S9	Changes bias frequency slightly, thereby it effectively stops the beat interference caused by bias oscillator and a-m local oscillator.

1-3. PRINCIPLES OF SHUT-OFF MECHANISM

TC-179 uses the automatic shut-off mechanism which ejects a tape cassette at the tape end in any mode. The tape end is detected mechanically at the take-up reel table. Referring to Fig. 1-1, automatic shut off mechanism operates as follows:

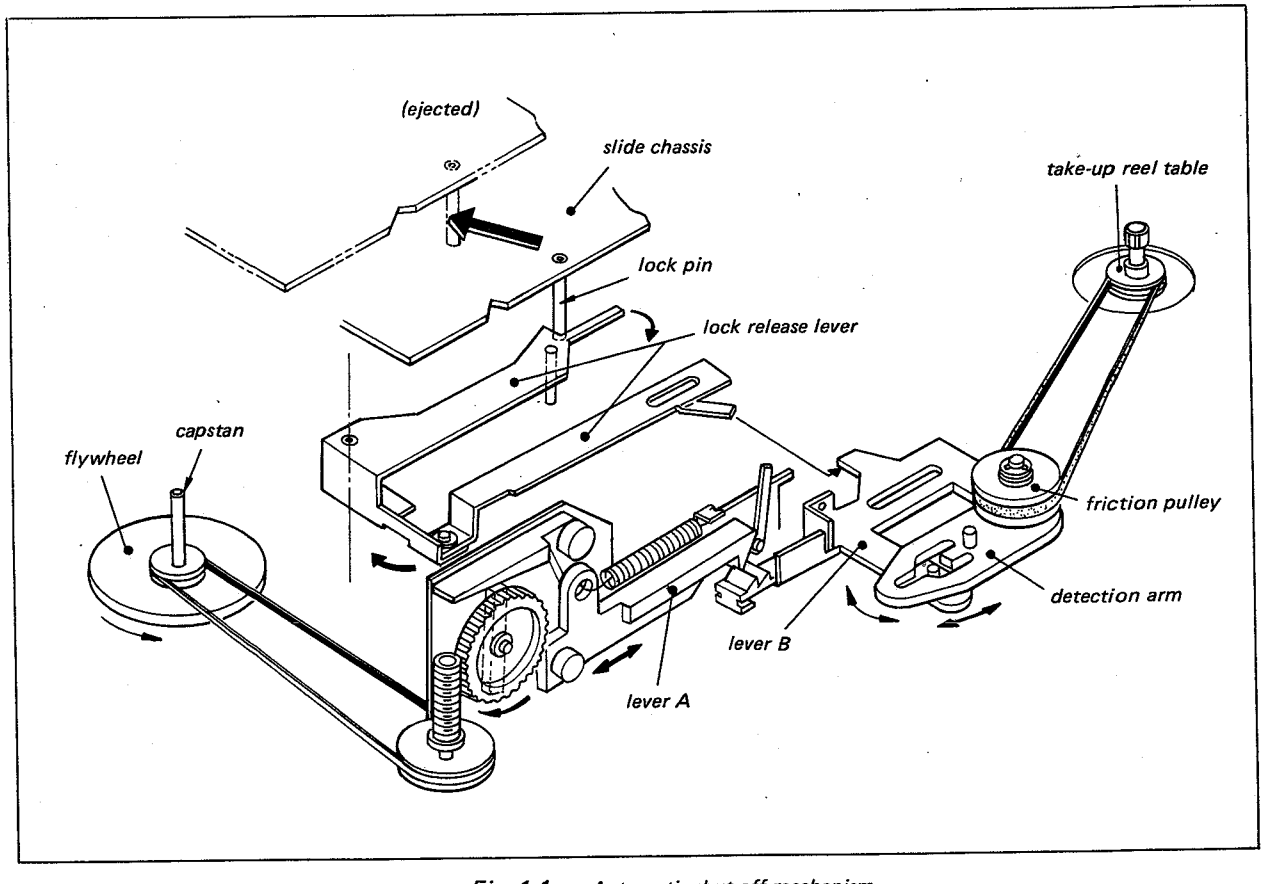


Fig. 1-1. Automatic shut-off mechanism

In Normal Operation (Forward, Fast Forward or Rewind Mode)

The rotation of capstan flywheel is transmitted through belt and gears and converted into back and force movement of lever B and lever A as shown in Fig. 1-1. The detection arm on the friction pulley swings corresponding to the direction of rotation and be driven by the pin on the lever A along with the slot in the arm as shown in Fig. 1-2.

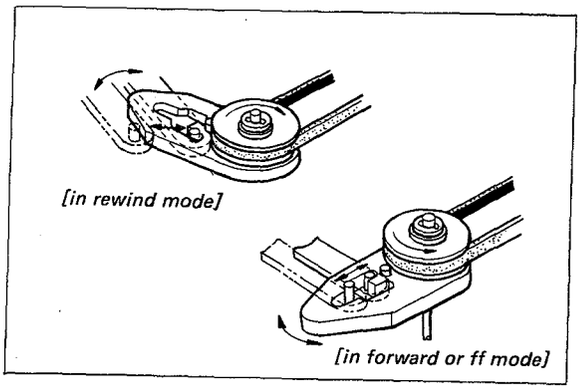


Fig. 1-2. Operation of detection arm

At the Tape End

Take-up reel stops and friction disappears at the friction pulley which has been generated the deflection force on the detection arm. As a result, one back and force movement makes the detection lever be parallel with the lever B as shown in Fig. 1-3. With next half cycle, pin on the lever B is restricted by the projection of the detection arm as shown in Fig. 1-3. Since the lever B still moves back and force, the pawl of the lever A now advanced to the point "b", as shown in Fig. 1-3. This permits the lever A to pull the lever B farther inner side. The projection of lever B now pushes the lock release lever. This frees the lock pin on the slide chassis as shown in Fig. 1-3 and 1-4.

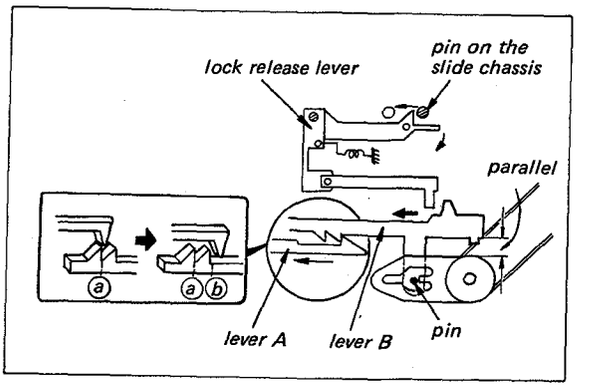


Fig. 1-3. Levers movement at tape end

Eject Operation

After the lock is released, the slide chassis is pulled back to the original position due to the tension springs at the same time the pushing rod eject the tape cassette out as shown in Fig. 1-5.

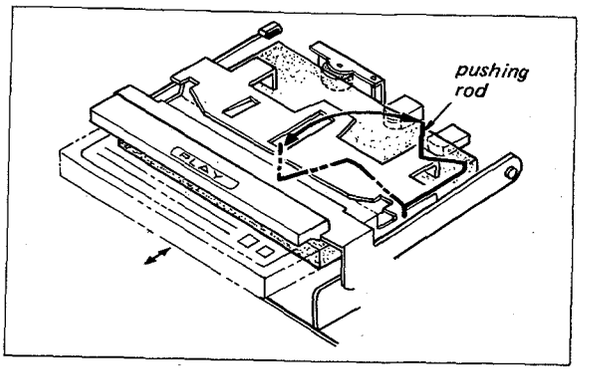


Fig. 1-5. Tape eject operation

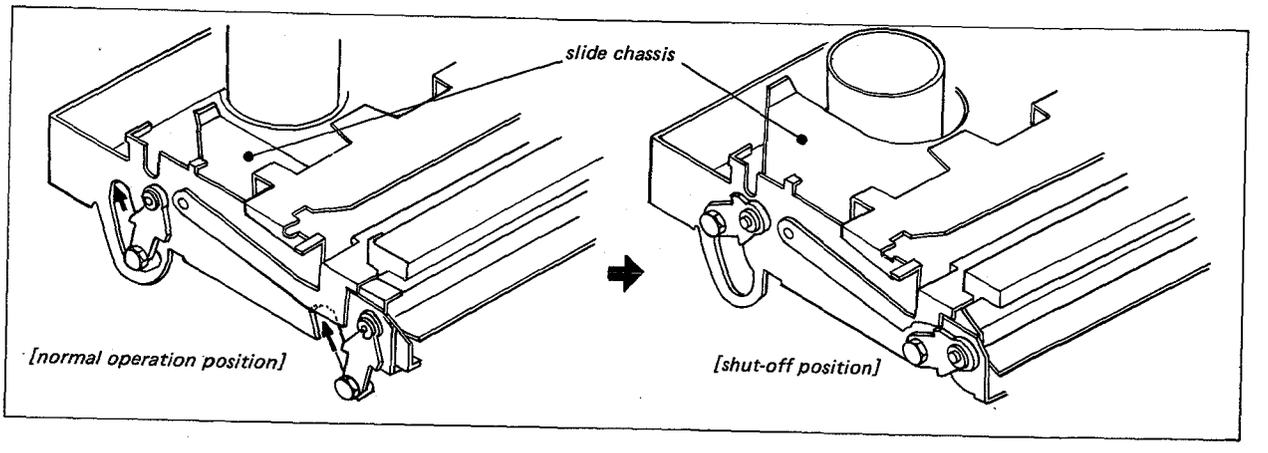


Fig. 1-4. Slide chassis movement

Reset Operation

During the eject operation, the lever A and detection arm are disengaged due to the movement of reset lever C and D which are actuated when the slide chassis moves back to its original position as shown in Fig. 1-6. This prevents the shut-off mechanism from being operated when the tape cassette is reinserted as soon as it is ejected.

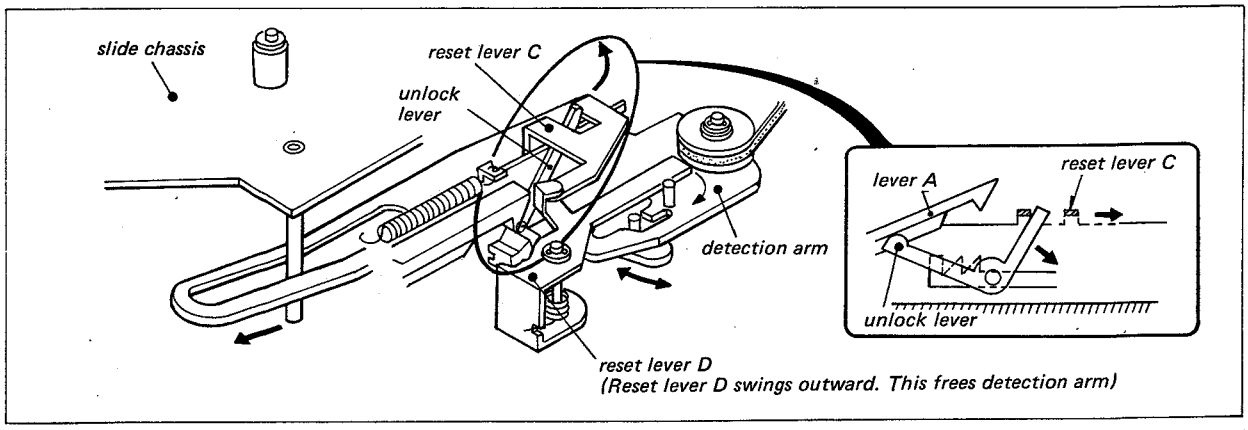
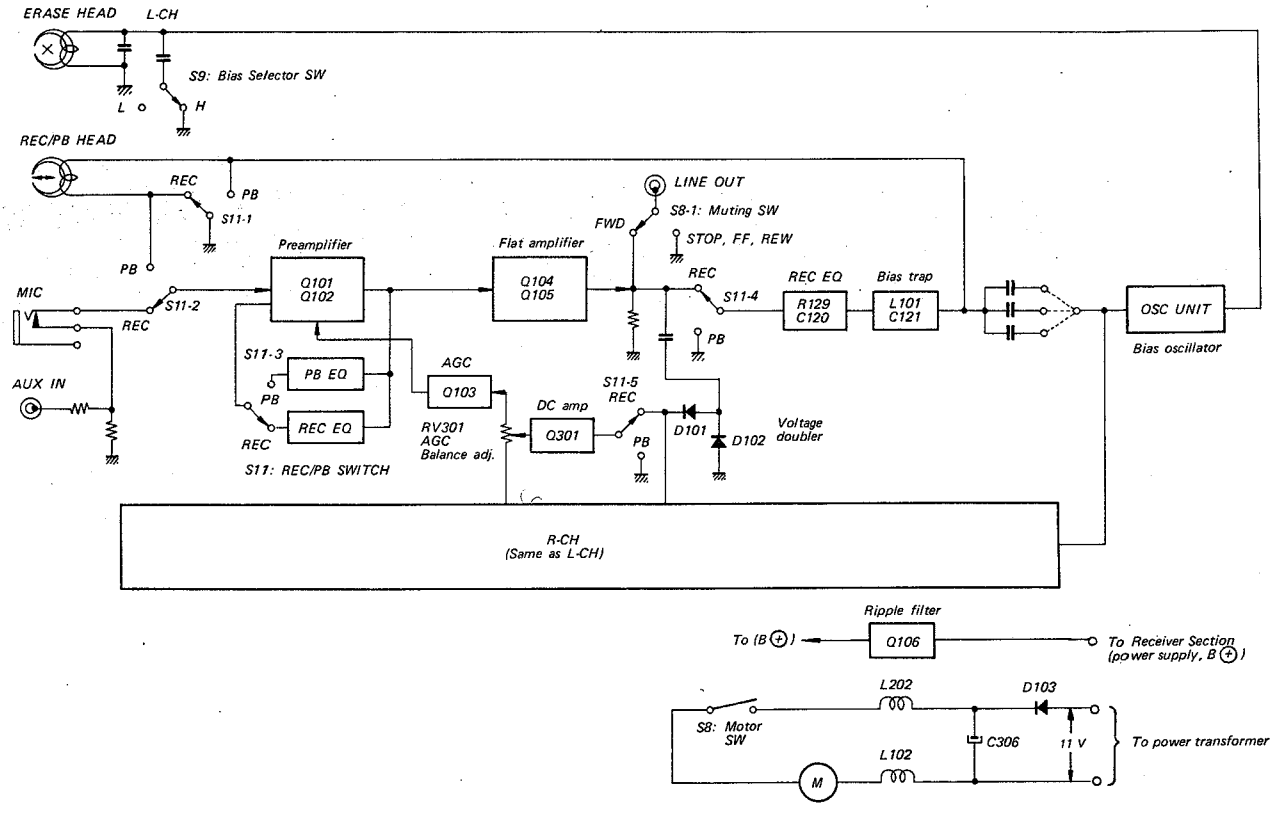


Fig. 1-6. Detail of reset operation

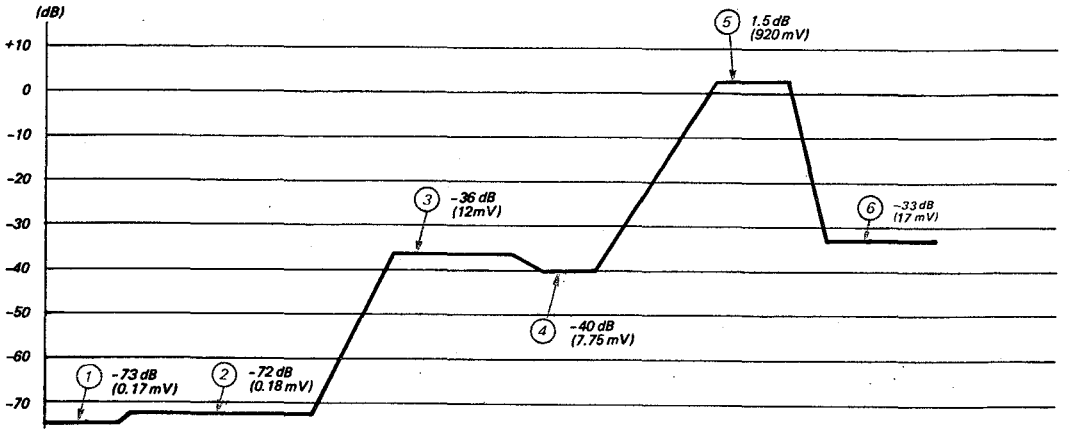
1-4. BLOCK DIAGRAM

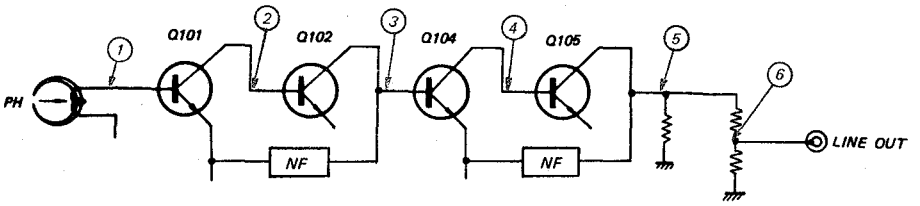


1-5. LEVEL DIAGRAMS

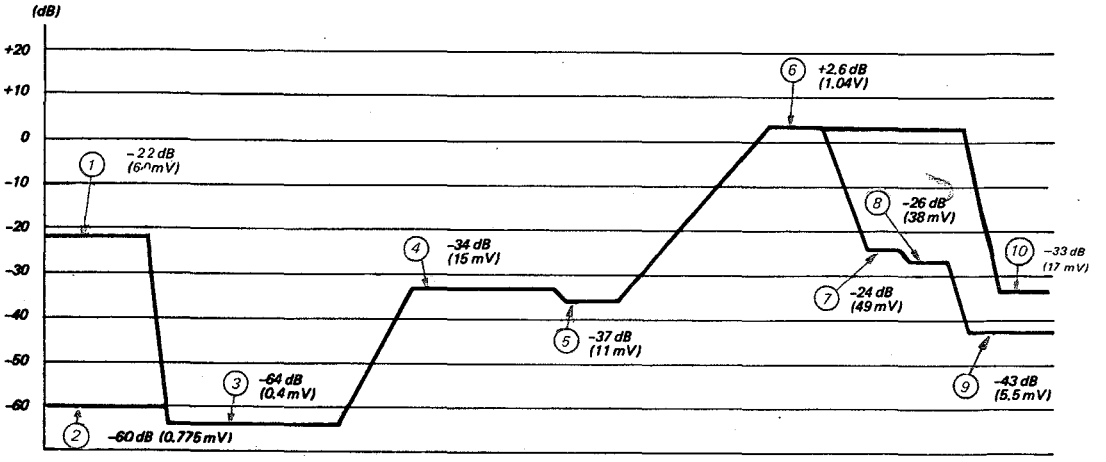
Note: Signal voltages are measured with an ac VTVM and expressed in dB referred to 0.775 V, 1 kHz.

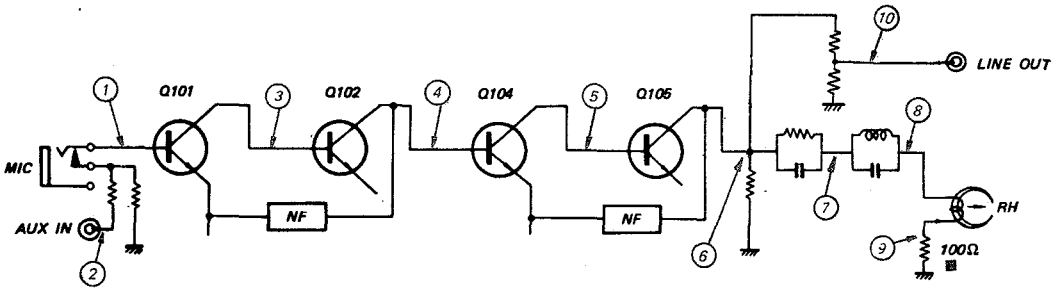
Playback Mode





Record Mode





■ Connect only when measuring level.

SECTION 2
DISASSEMBLY AND REPLACEMENT

WARNING

Unplug the ac power cord before starting any disassembly or replacement procedures.

Note: All screws in this service manual are Phillips type (cross recess type) unless otherwise indicated. (-); slotted head.

2-1. CASSETTE DECK REMOVAL

1. Remove the record changer and wooden case as described in main component section on page 5.
2. Remove the six screws (① and ②) and two mic jack nuts.
3. Disconnect the 3-p, 4-p and 5-p connectors (③, ④ and ⑤).
4. Unsolder the lead-wire at Bias Selector switch mounted on rear panel.
5. Remove the cassette deck in the arrow direction as shown.

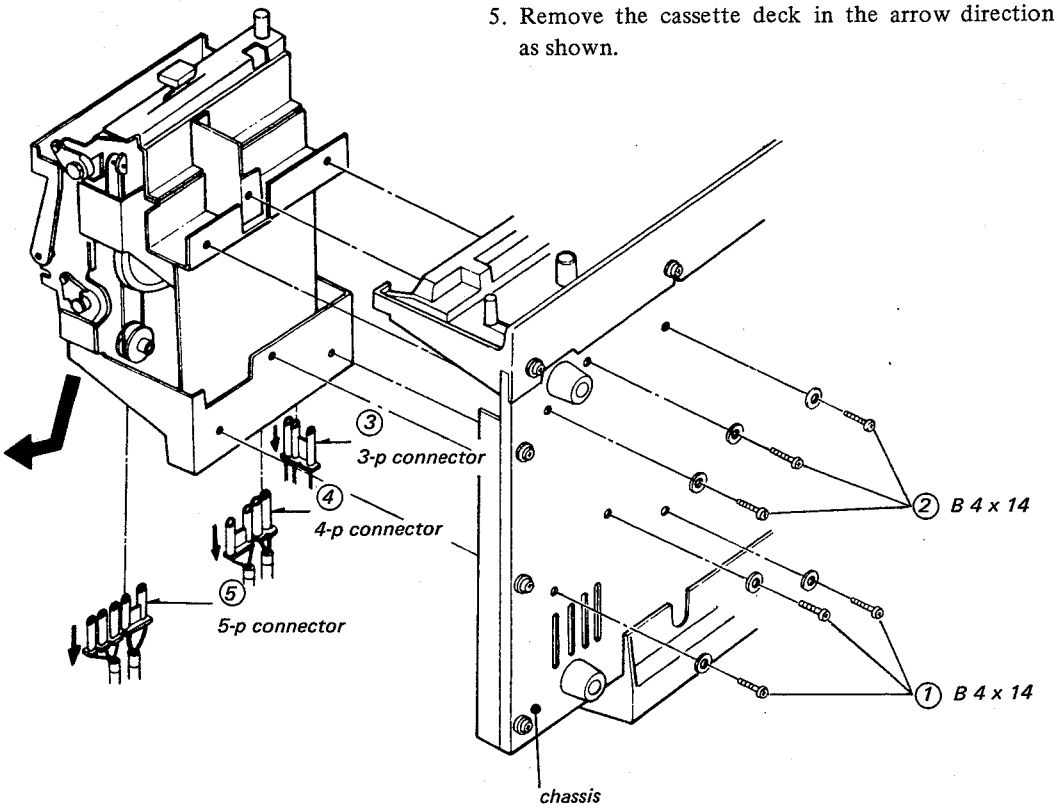


Fig. 2-1. Cassette deck removal

2-2. REC/PB AMPLIFIER BOARD REMOVAL

Note: Be careful not to break the lead wires when removing the circuit board.

1. Remove the cassette deck as shown in Fig. 2-1.
2. Remove the five screws shown in Fig. 2-2. This frees front main chassis bracket (A).
3. Unsolder the phono cord (LINE OUT) from the MUTING switch shown in Fig. 2-3.
4. Remove the two nylon rivets shown in Fig. 2-3.
5. Remove the circuit board in the arrow direction as shown in Fig. 2-3.

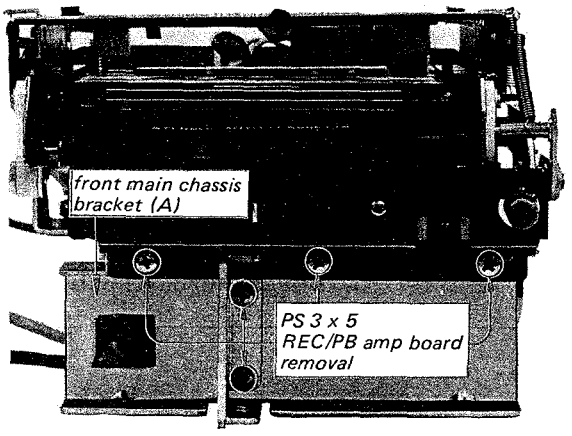


Fig. 2-2. REC/PB amplifier board removal (1)

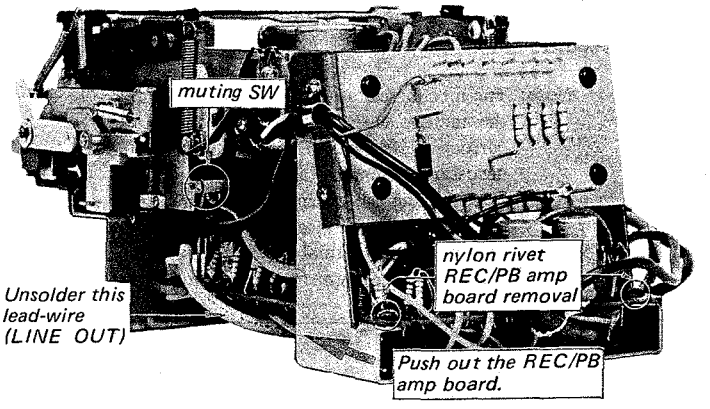


Fig. 2-3. REC/PB amplifier board removal (2)

2-3. CHASSIS LAYOUT

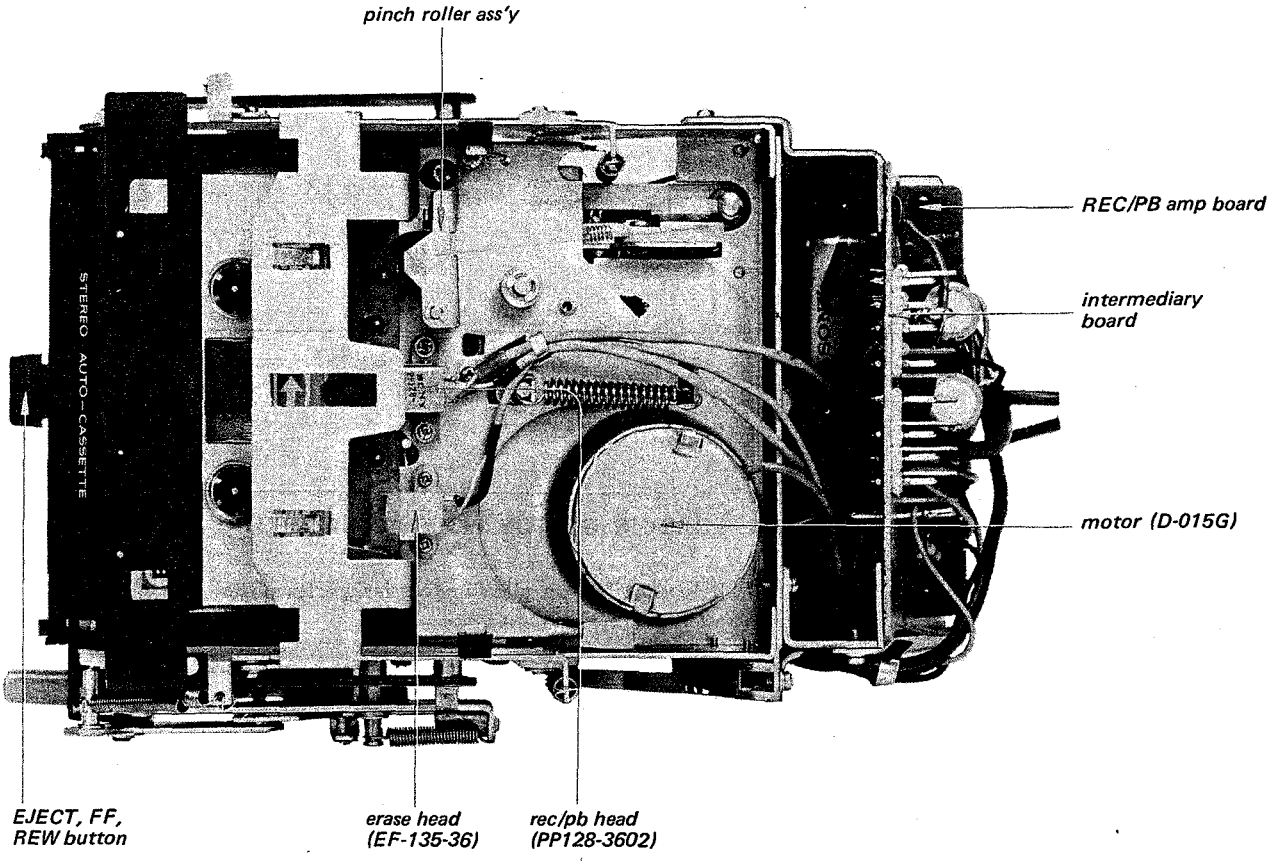


Fig. 2-4. Top view

SECTION 3
MECHANICAL ADJUSTMENTS

Prepare for performing any mechanical adjustments by removing the cassette deck as described in Procedure 2-1.

Note: The mechanical assembly is shipped from the factory with all adjustments set for correct performance. It should be unnecessary to change any adjustment before putting the equipment into service, unless shipping damage has occured. In the course of normal service, or in the event of component failure and replacement of parts, some readjustment may be necessary.

3-1. TOOLS REQUIRED

The following tools are required to perform mechanical adjustment procedures on the TC-179.

1. Torque driver (See Fig. 3-4) or equivalent
2. Special spring scale (See Fig. 3-6) or equivalent

3-2. FLYWHEEL END-PLAY ADJUSTMENT

1. In the STOP mode, check the end play of the flywheel. There should be slight end-play between the flywheel and its thrust screw.
2. End play can be changed by turning the thrust screw as shown.

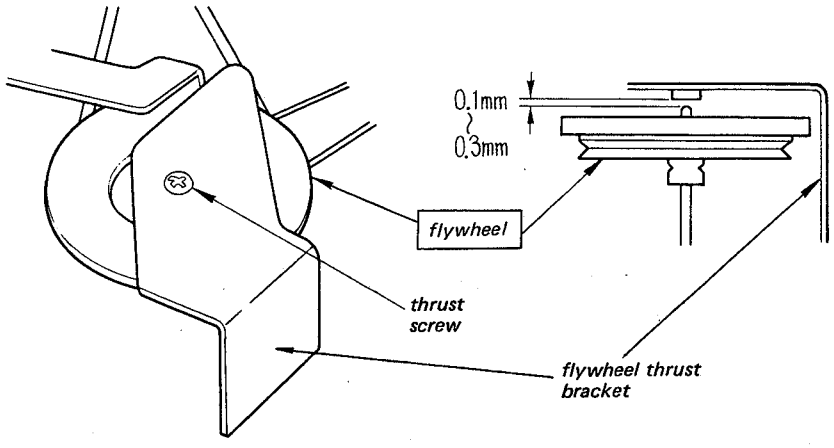


Fig. 3-1. Flywheel end-play adjustment

3-3. LOADING BUTTON PLAY ADJUSTMENT

If loading button play is excessive, perform the adjustment as shown.

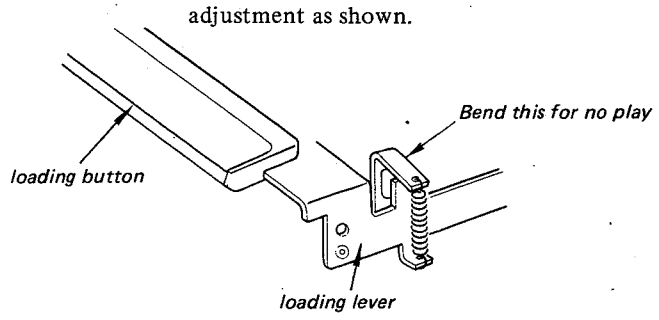


Fig. 3-2. Loading button play adjustment

3-4. MOTOR PULLEY HEIGHT ADJUSTMENT

1. Loosen the set screw securing the motor pulley.
2. Adjust the height of the motor pulley so that the belt tracks correctly in a straight line as shown.
3. After completing the adjustment, check to see that the belt is not twisted or dirty.

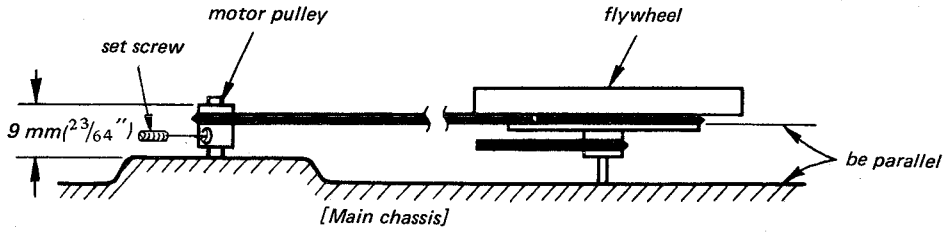


Fig. 3-3. Motor pulley height adjustment

3-5. TAKE-UP AND FF/REW TENSION CHECKOUT

Take-up and ff/rew tension is checked by measuring the take-up reel and supply reel table's torque in the playback, ff and rewind modes with the special torque driver (or equivalent) as follows:

In the forward, ff and rewind mode, check the take-up and ff/rew torque as follows:

1. Release the torque driver clamp first, and then place it slowly onto the take-up or supply reel table's shaft as shown in Fig. 3-4. Be certain that the torque driver clutches the shaft properly.
2. Observe the readings on the scale shown in Fig. 3-5. They should be as follows:

   FWD torque; 0.35 to 0.65 kg-mm
   FF/REW torque; 0.75 to 1.4 kg-mm

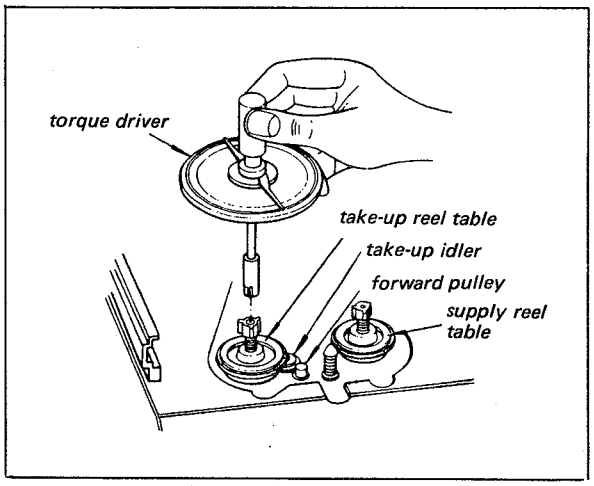


Fig. 3-4. Take-up tension measurement

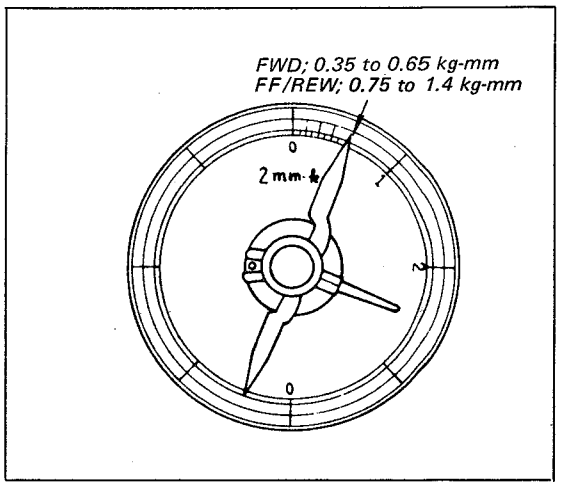


Fig. 3-5. Torque driver indication

3-6. PINCH ROLLER PRESSURE CHECK

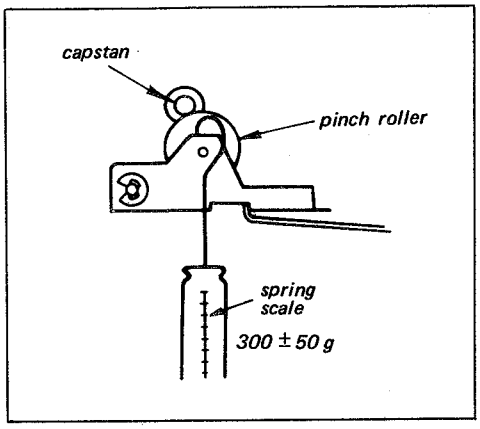


Fig. 3-6. Pinch roller pressure check

The pinch roller is forced against the capstan by the action of pressure spring.
Insufficient pressure may cause slippage on the capstan while excessive pressure throws an unnecessary load on the capstan bearing causing speed reduction.
Pinch roller pressure should be maintained within the recommended value.

1) In FWD mode, attach a spring scale to the pinch roller as shown in Fig. 3-6.
2) Take a reading only when the pinch roller is pulled backward by the spring scale and then start to return towards the capstan, because the force required to overcome the static friction will produce a false and excessively high initial readings.
3) The readings should be 250 to 350 g. If necessary, check and replace the pinch roller ass'y.

SECTION 4
ELECTRICAL ADJUSTMENTS

CAUTION

1. Always connect the main chassis with the cassette deck chassis electrically when performing electrical adjustments.
2. Perform head cleaning and demagnetizing procedures before starting electrical adjustments.
3. After replacing the REC/PB head, electrical adjustments should be performed in the following sequence:
   (1) Head azimuth adjustment
   (2) Playback level adjustment
   (3) Record bias adjustment
   (4) AGC balance adjustment

4-1. TEST EQUIPMENT AND TOOLS REQUIRED

1. SONY test tapes
   P-4-A81 (6.3 kHz, −10 dB)
   . . . . . Head azimuth adj.
   P-4-L81 (333 Hz, 0 dB)
   . . . . . Playback level adj.
   SPC-4 (1 kHz) . . . . Tape speed adj.
2. Audio oscillator
3. Attenuator, 600 ohms unbalanced
4. Ac VTVM or Level Meter
5. 600 Ω and 100 kΩ resistor, ¼ watt
6. Connection cord
7. Screwdriver, 3 mm blade
8. Frequency counter

4-2. TAPE SPEED ADJUSTMENT

1. With the equipment connected as shown in Fig. 4-1, playback the beginning and the end portions of the SONY test tape SPC-4.
2. Measure the frequency through the terminal posts on the intermediary board (107' or 207') (See Fig. 4-9), by using a digital frequency counter. The reading should be as follows:

   Frequency: Within 970 to 1,030 Hz
   Difference between the beginning and the end: Within 10 Hz

   If necessary, replace the motor pulley referring to the following table.

Motor Pulley

Part No.	Identification	Tape Speed	
3-509-091-01	a, b groove	−3.0 %	↑
3-509-091-11	a groove	−1.0 %	decrease
3-509-091-21	no groove	standard	┼
3-509-091-31	c groove	+ 1.5 %	increase
3-509-091-41	b, c groove	+ 3.0 %	↓

Note: After replacing the motor pulley, adjust the Motor Pulley Height as described in Procedure 3-4 on page 49.

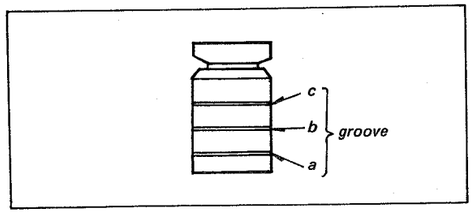


Fig. 4-2. Motor pulley

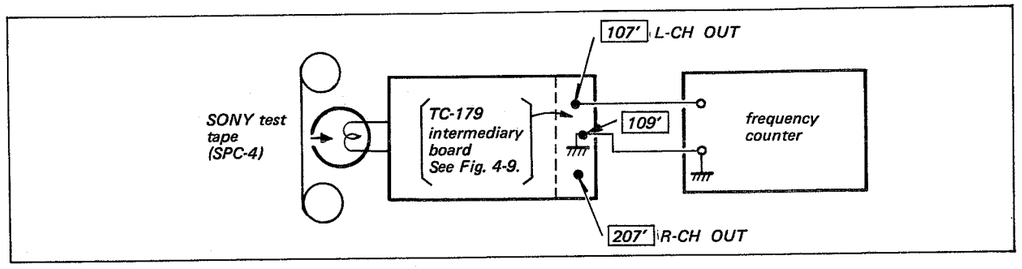


Fig. 4-1. Tape speed adjustment test setup

4-3. HEAD AZIMUTH ADJUSTMENT

1. With the equipment connected as shown in Fig. 4-3, playback the SONY test tape P-4-A81.
2. Adjust the azimuth adjustment screw (see Fig. 4-4) for maximum output on the ac VTVM.

   Note: If the maximum output points of both channels do not coincide, readjust the adjustment screw for minimum difference between left- and right-channel output. If the head azimuth is far out of alignment, minor peaks may be observed before maximum peak as shown in Fig. 4-5. The proper setting is the higher of the two peaks.

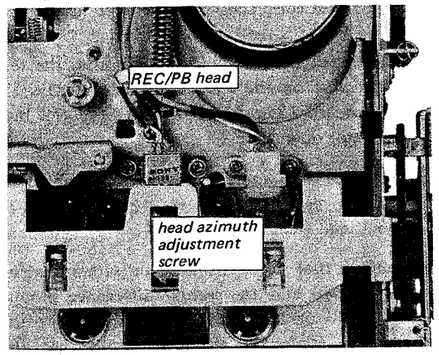


Fig. 4-4. Adjustment parts location

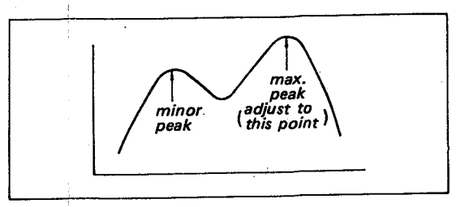


Fig. 4-5. Output response of azimuth adjustment

4-4. PLAYBACK LEVEL ADJUSTMENT

1. With the equipment connected as shown in Fig. 4-3, playback the SONY test tape P-4-L81.
2. Measure the L-CH output level. It should be + 1.5 dB ± 1.5 dB (0 dB = 0.775 volt). If necessary, check and repair the preamplifier and flat amplifier.
3. Check the R-CH output level, turn adjustable resistor RV202 (see Fig. 4-6) to obtain the same output level as in the L-CH.

4-5. RECORD BIAS ADJUSTMENT

1. With the equipment connected as shown in Fig. 4-8, record the 1 kHz and the 6.3 kHz signals of −90 dB (23.25 μV) through the MIC jack.
2. Playback the recorded signals and measure the output levels of the two signals.
   The 6.3 kHz signal should be within 3 dB referred to the 1 kHz signal.

   Note: The difference between two channels should be also within 3 dB.

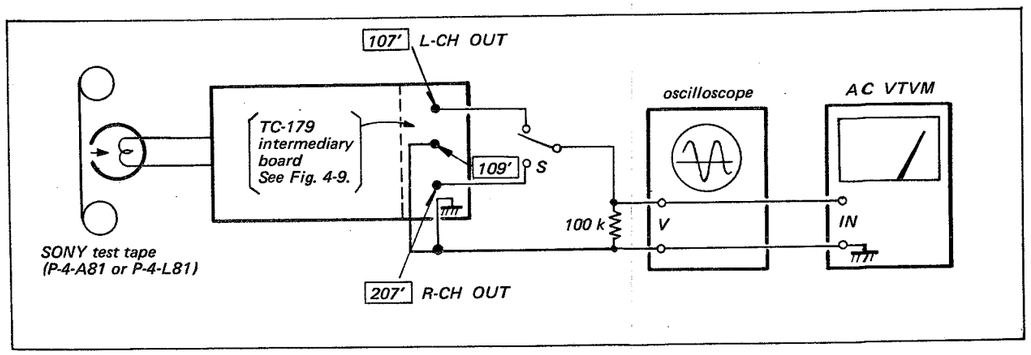


Fig. 4-3. Head-azimuth and playback-level adjustment test setup

If necessary, change the value of bias capacitor by soldering the patterns on the circuit board as follows (See Fig. 4-7):

(a) If the 6.3 kHz level is higher than 1 kHz, increase the capacitance value.

(b) If the 6.3 kHz level is lower than 1 kHz, decrease the capacitance value.

L-CH: C122 ~ C124
R-CH: C222 ~ C224
) See Fig. 4-7.

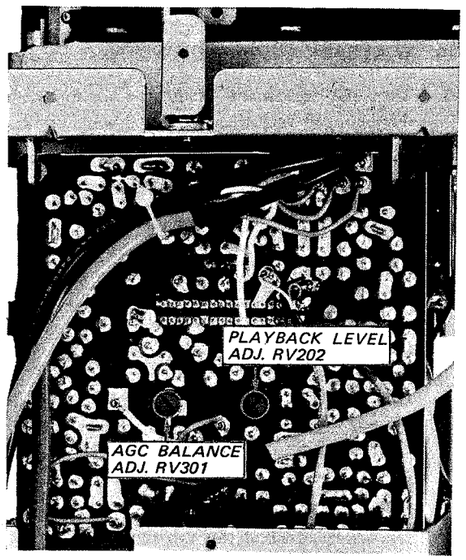


Fig. 4-6. Adjustment parts location

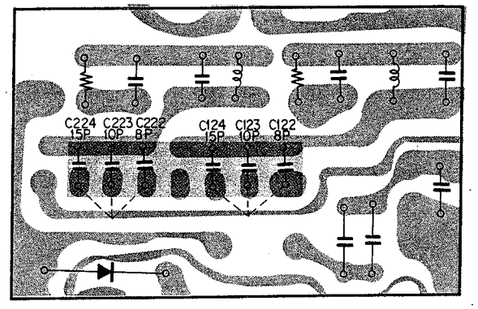


Fig. 4-7. Record bias adjustment

4-6. AGC BALANCE ADJUSTMENT

Note: This adjustment should be performed after completing playback level adjustment.

1. Disconnect the yellow lead-wire from the terminal post on the component side of REC/PB amp board (See Fig. 4-10) to stop the bias oscillator operation.
2. With the equipment connected as shown in Fig. 4-8, record a 1 kHz, −50 dB (2.4 mV) signal, and then play it back.
3. Confirm that both channels outputs are within 4 ±1 dB and the output difference should be 0.5 dB or less. If necessary, turn the adjustable resistor RV301 (see Fig. 4-6) to obtain the same outputs.
4. Reconnect the yellow lead wire disconnected in step 1.

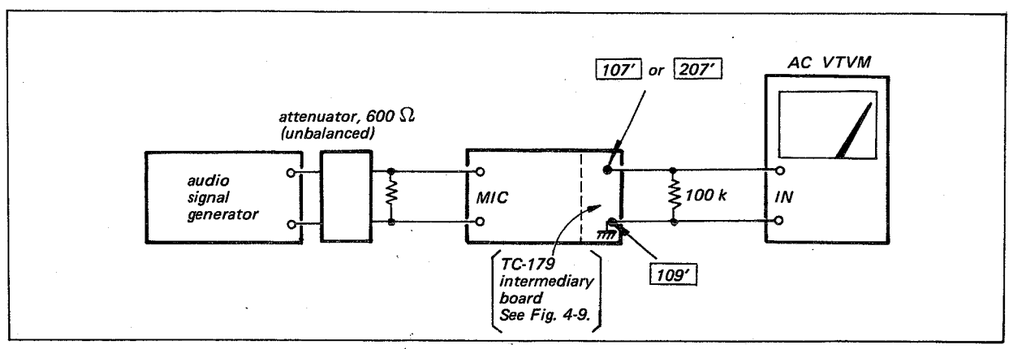


Fig. 4-8. Record bias and agc balance adjustment test setup

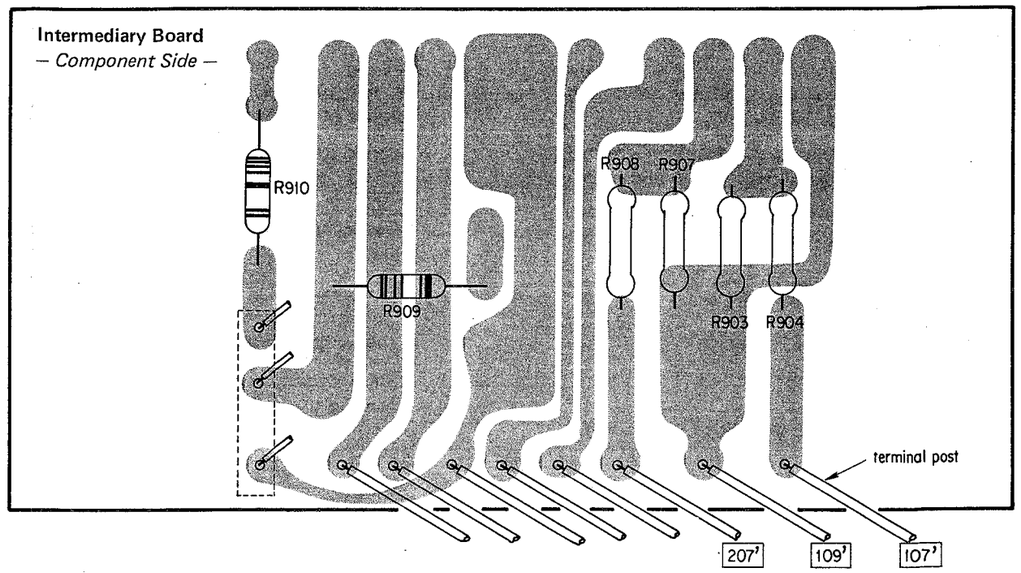


Fig. 4-9. Test point location

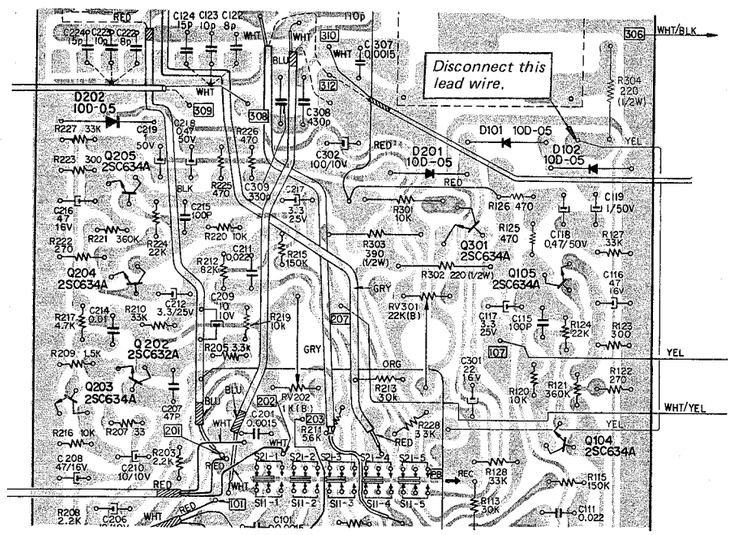
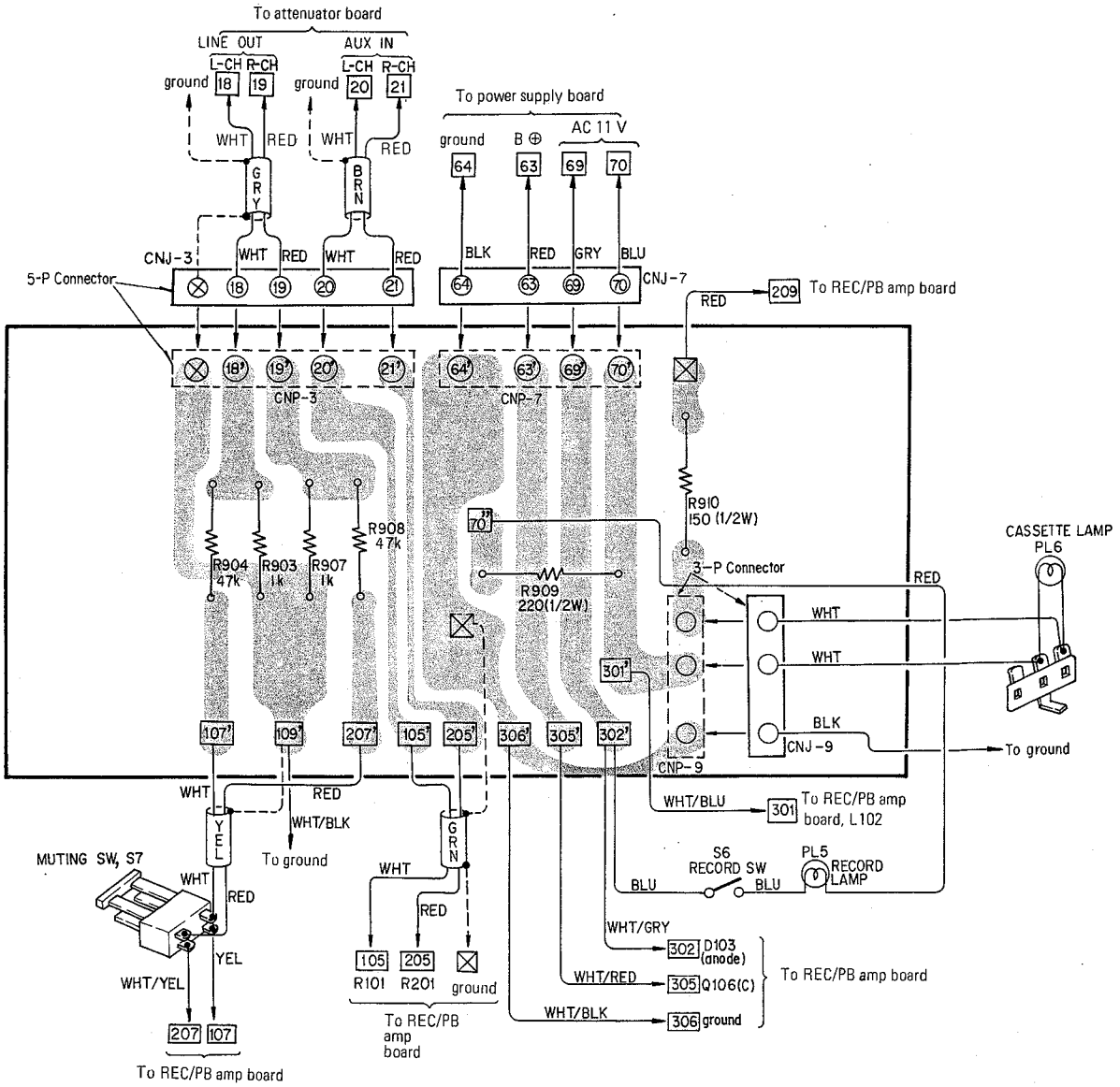


Fig. 4-10. Lead wire removal

SECTION 5
DIAGRAMS

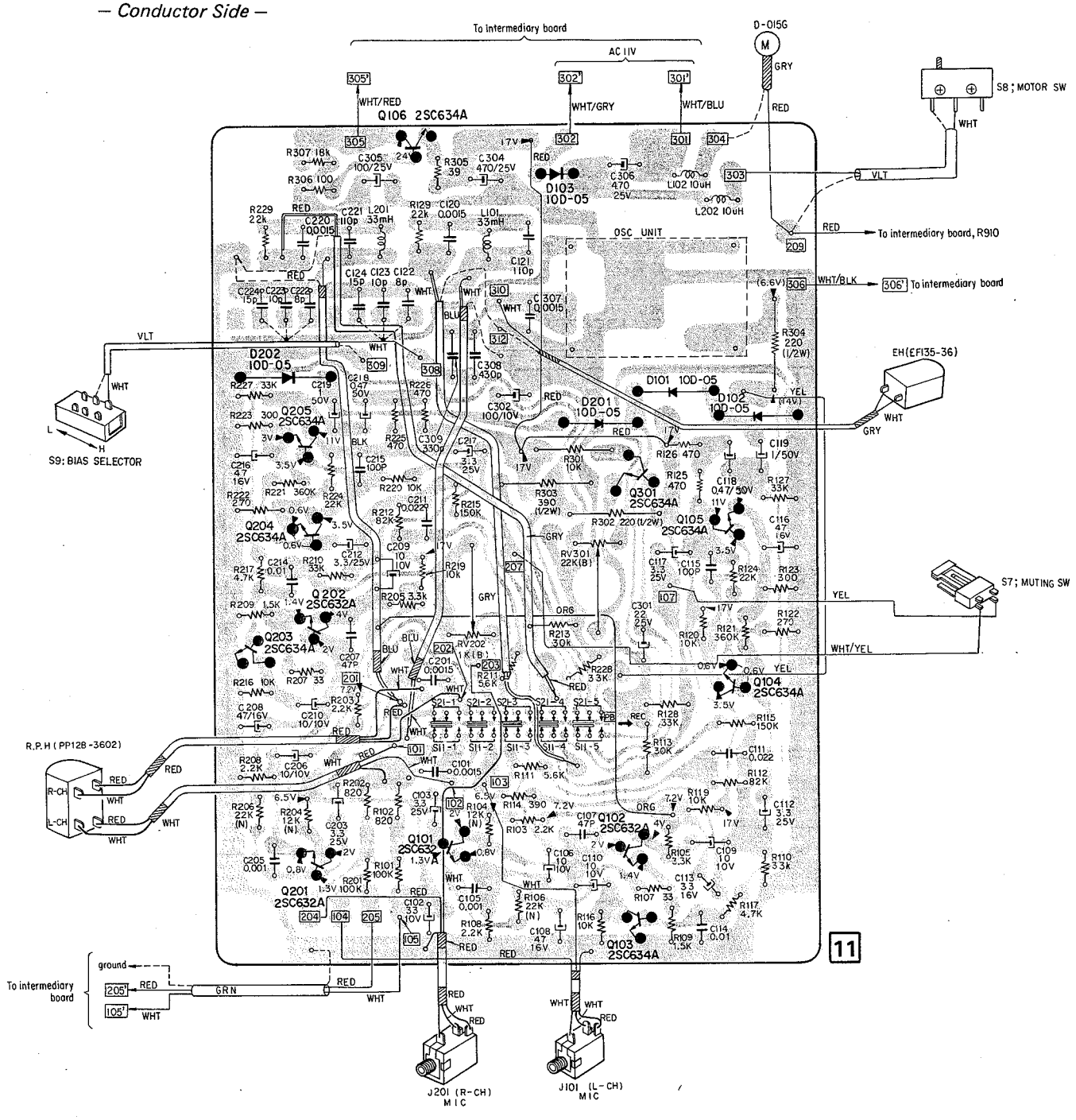
5-1. MOUNTING DIAGRAM — Intermediary Board —

— Conductor Side —



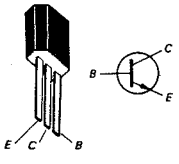
5-2. MOUNTING DIAGRAM – REC/PB Amplifier Board –

– Conductor Side –

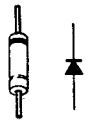


Note: ( )record mode

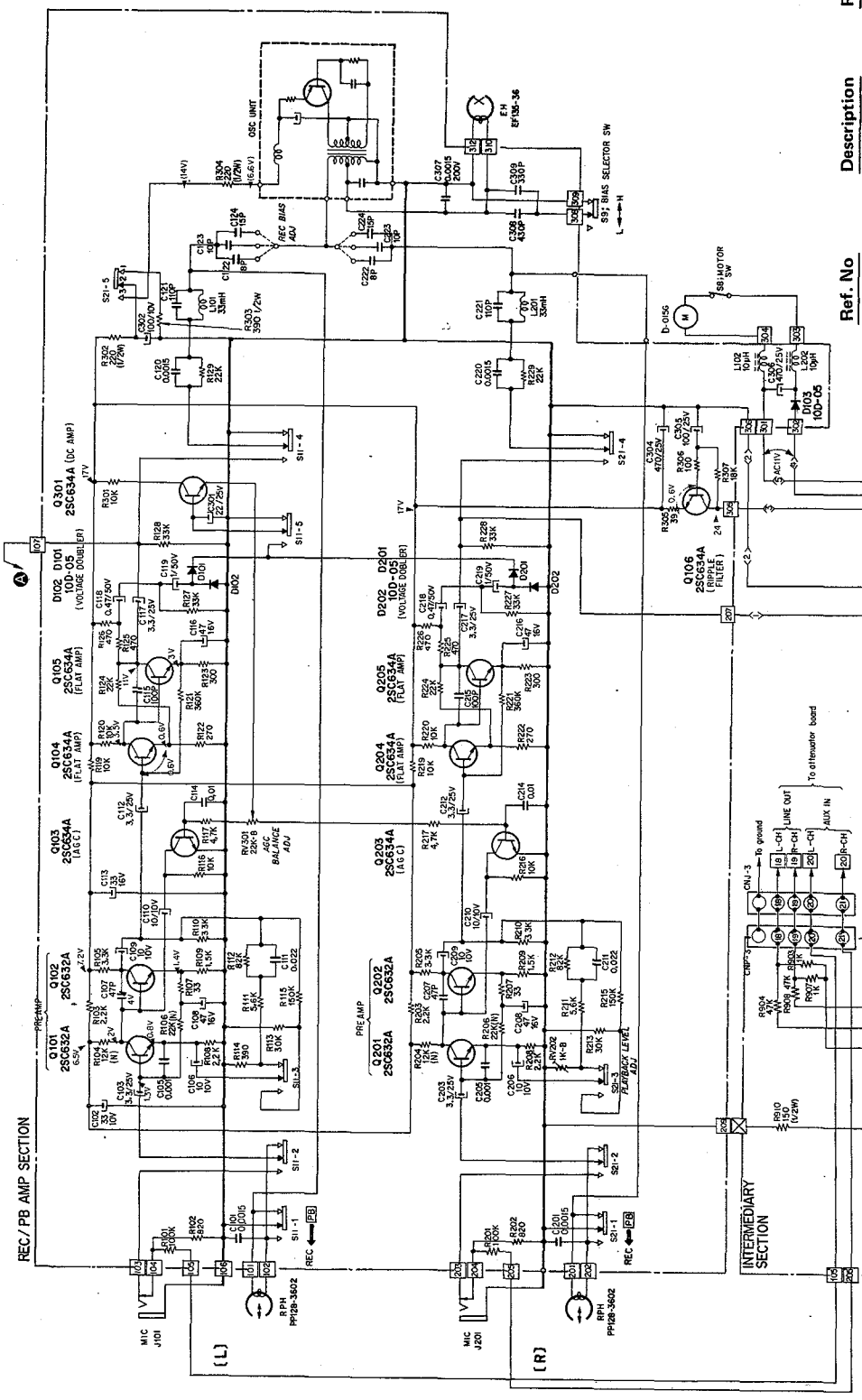
2SC632A
2SC634A



10D-05



5-3. SCHEMATIC DIAGRAM – Stereo Cassette Deck Section –



Ref. No	Description	Position
S6	RECORD SW	OFF
S7	MUTING SW	OFF
S8	MOTOR SW	ON
S9	BIAS SELECTOR SW (H-L)	H
S11 (S21)	REC/PB SW (PB-REC)	PB

Note:

All resistance values are in ohms. k=1,000, M=1,000k
All capacitance values are in μF except as indicated with p, which means μμF.
All voltages are dc measured with a VOM which has an input impedance of 20k ohms/volt. No signal in.
Voltages in ( ) are measured in record mode.
All voltages represent an average value.

SECTION 6
EXPLODED VIEWS

(1)

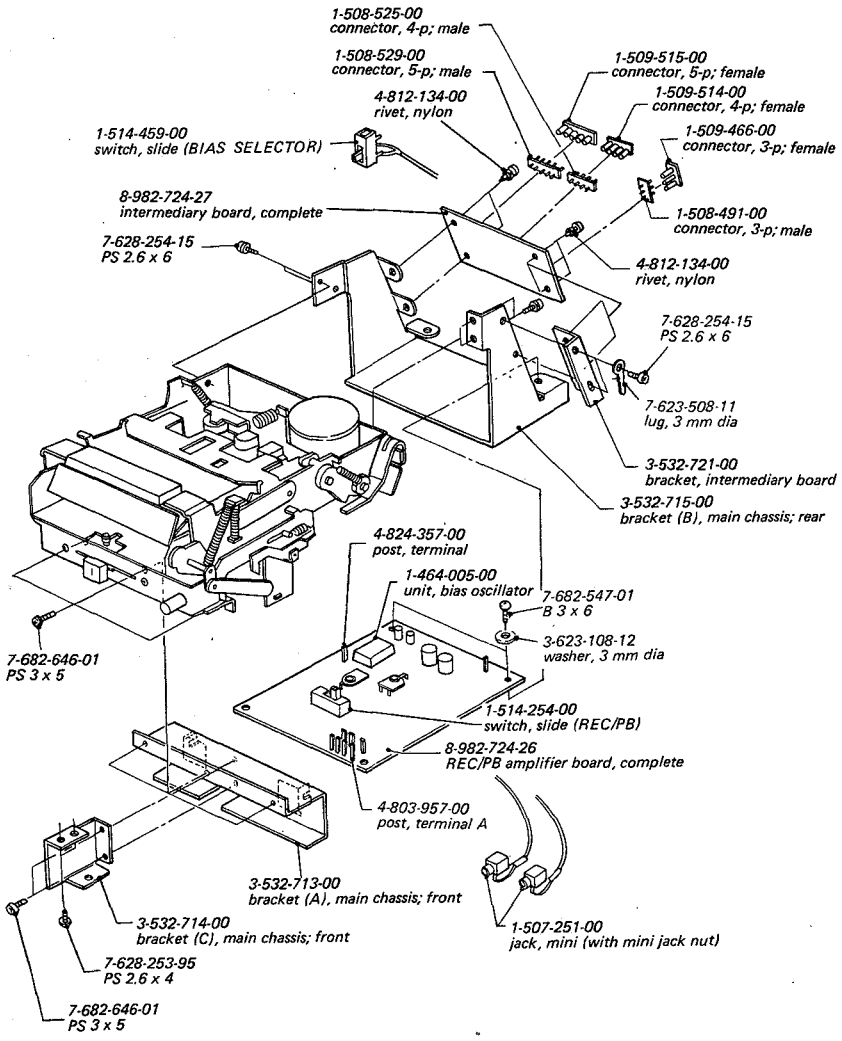
Note: All screws in this service manual are Phillips type (cross recess type) unless otherwise indicated.
(–); slotted head.

P – Pan Head Screw
PS – Pan Head Screw with Spring Washer
K – Flat Countersunk Head Screw
B – Binding Head Screw
RK – Oval Countersunk Head Screw
T – Truss Head Screw
R – Round Head Screw
F – Flat Fillister Head Screw
SC – Set Screw
E – Retaining Ring (E Washer)

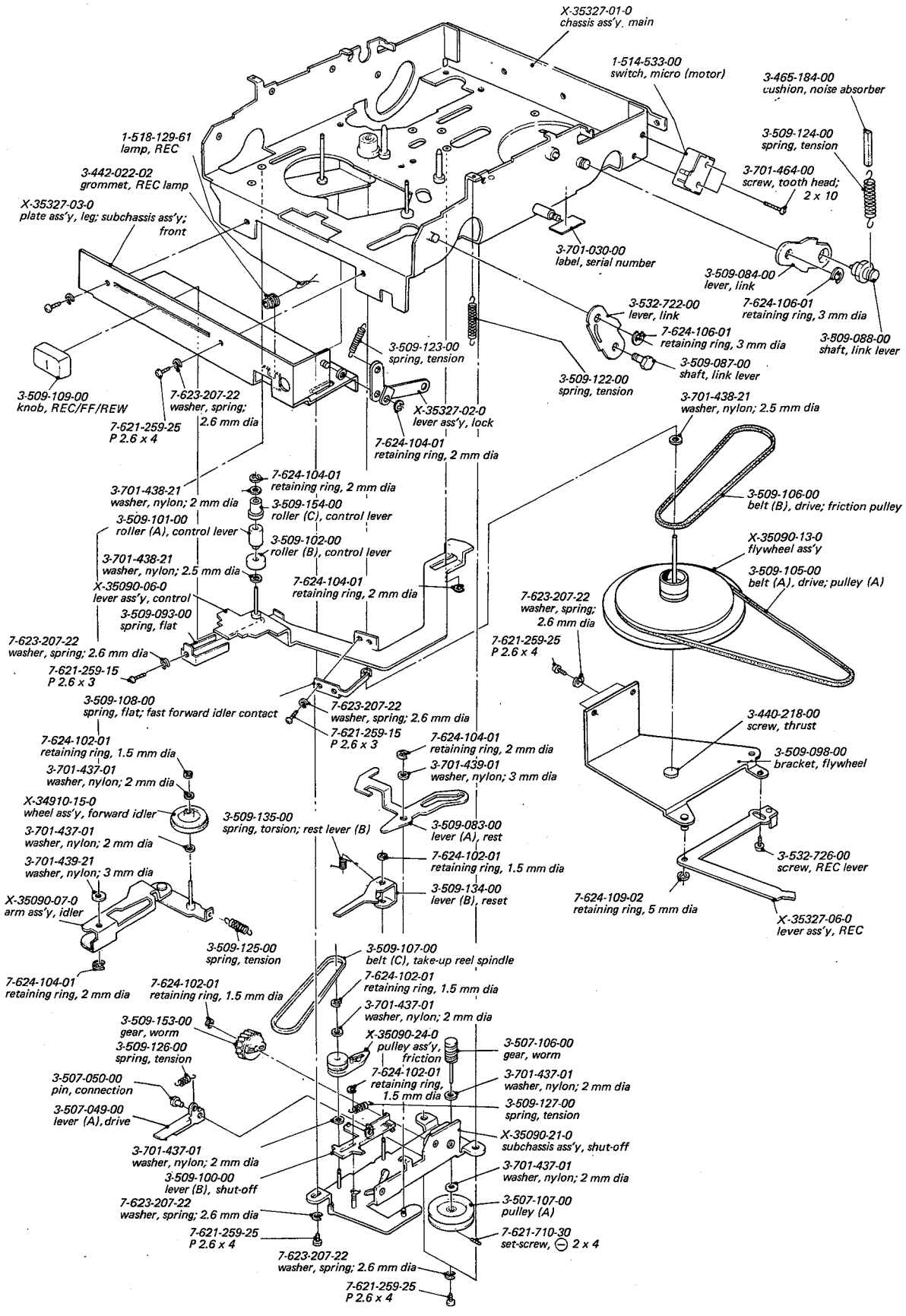
W – Washer
SW – Spring Washer
LW – Lock Washer
N – Nut

– Example –

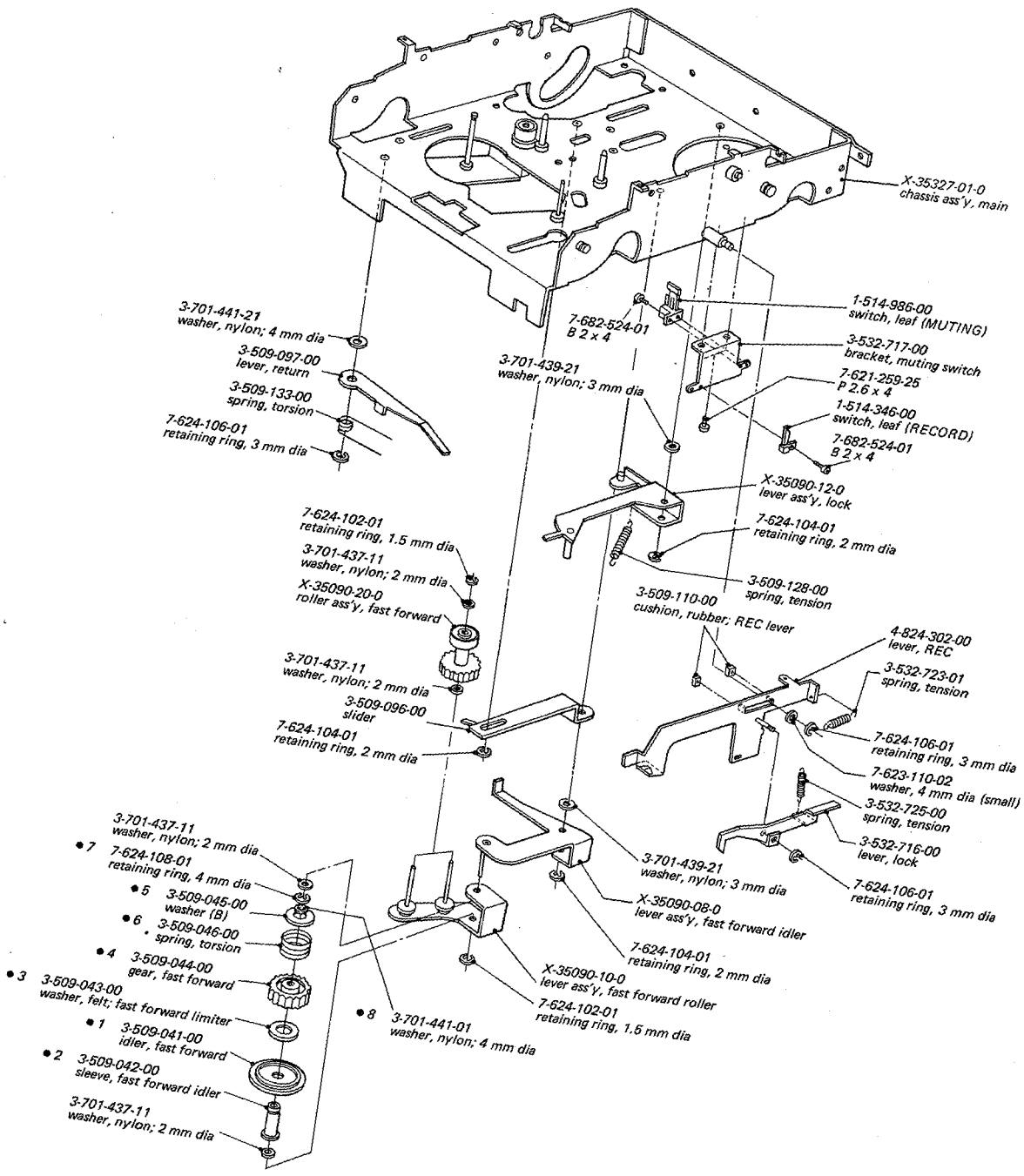
⊕ P 3x10
- Type of Slot
- Length in mm (L)
- Diameter in mm (D)
- Type of Head



(2)

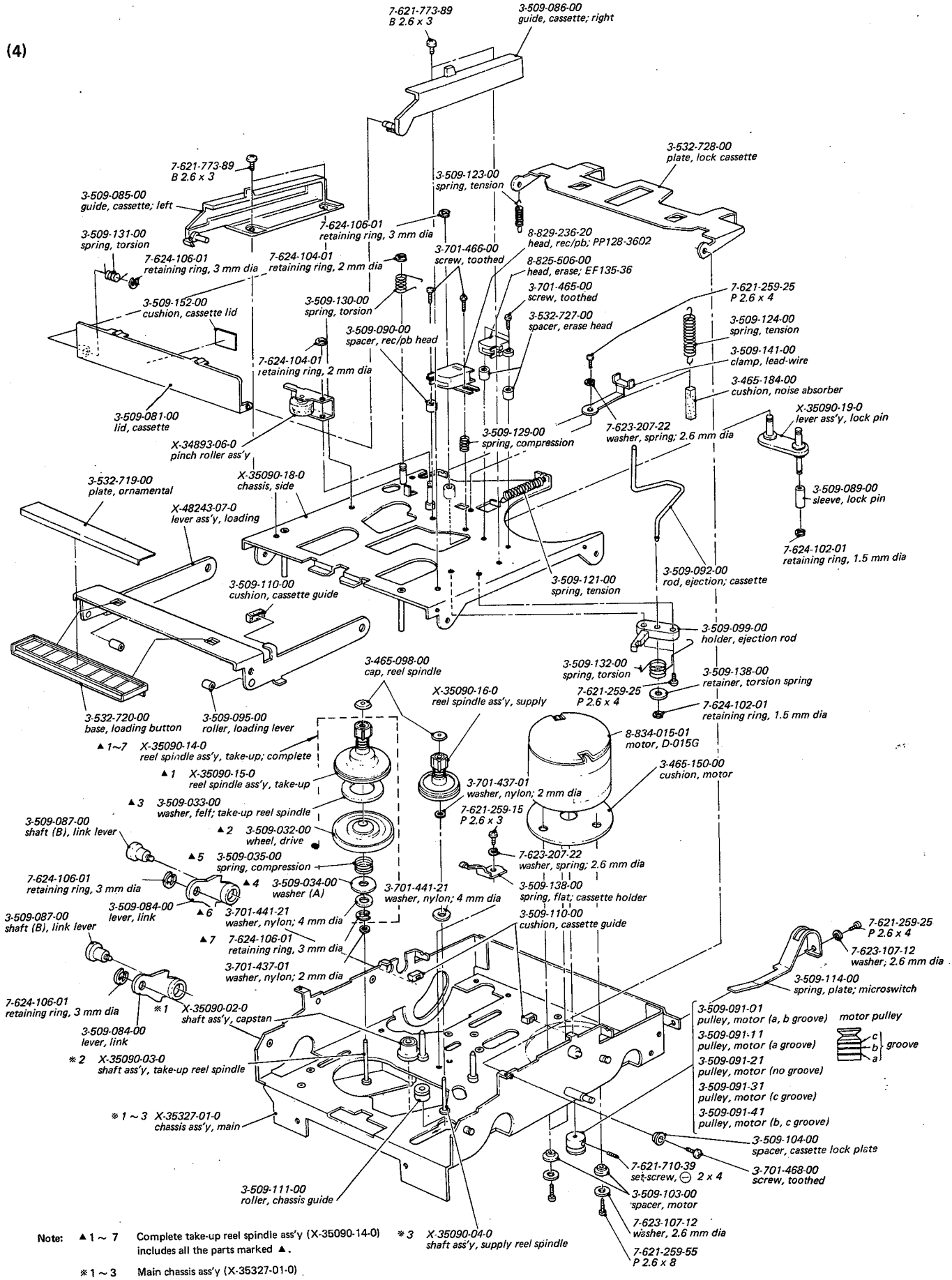

X-35327-01-0
chassis ass'y, main
1-514-533-00
switch, micro (motor)
3-465-184-00
cushion, noise absorber
1-518-129-61
lamp, REC
3-509-124-00
spring, tension
3-442-022-02
grommet, REC lamp
3-701-464-00
screw, tooth head; 2 x 10
X-35327-03-0
plate ass'y, leg; subchassis ass'y; front
3-701-030-00
label, serial number
3-509-084-00
lever, link
3-532-722-00
lever, link
7-624-106-01
retaining ring, 3 mm dia
7-624-106-01
retaining ring, 3 mm dia
3-509-088-00
shaft, link lever
3-509-123-00
spring, tension
3-509-087-00
shaft, link lever
3-509-122-00
spring, tension
3-509-109-00
knob, REC/FF/REW
7-623-207-22
washer, spring; 2.6 mm dia
7-621-259-25
P 2.6 x 4
X-35327-02-0
lever ass'y, lock
7-624-104-01
retaining ring, 2 mm dia
3-701-438-21
washer, nylon; 2.5 mm dia
7-624-104-01
retaining ring, 2 mm dia
3-701-438-21
washer, nylon; 2 mm dia
3-509-154-00
roller (C), control lever
3-509-101-00
roller (A), control lever
3-509-102-00
roller (B), control lever
3-701-438-21
washer, nylon; 2.5 mm dia
7-624-104-01
retaining ring, 2 mm dia
X-35090-06-0
lever ass'y, control
3-509-093-00
spring, flat
7-623-207-22
washer, spring; 2.6 mm dia
7-621-259-15
P 2.6 x 3
3-509-106-00
belt (B), drive; friction pulley
X-35090-13-0
flywheel ass'y
3-509-105-00
belt (A), drive; pulley (A)
7-623-207-22
washer, spring; 2.6 mm dia
7-621-259-25
P 2.6 x 4
3-509-108-00
spring, flat; fast forward idler contact
7-623-207-22
washer, spring; 2.6 mm dia
7-621-259-15
P 2.6 x 3
3-440-218-00
screw, thrust
3-509-098-00
bracket, flywheel
7-624-102-01
retaining ring, 1.5 mm dia
7-624-104-01
retaining ring, 2 mm dia
3-701-437-01
washer, nylon; 2 mm dia
3-701-439-01
washer, nylon; 3 mm dia
X-34910-15-0
wheel ass'y, forward idler
3-509-135-00
spring, torsion; rest lever (B)
3-509-083-00
lever (A), rest
3-701-437-01
washer, nylon; 2 mm dia
7-624-102-01
retaining ring, 1.5 mm dia
3-701-439-21
washer, nylon; 3 mm dia
3-509-134-00
lever (B), reset
3-532-726-00
screw, REC lever
X-35090-07-0
arm ass'y, idler
7-624-109-02
retaining ring, 5 mm dia
X-35327-06-0
lever ass'y, REC
3-509-125-00
spring, tension
3-509-107-00
belt (C), take-up reel spindle
7-624-104-01
retaining ring, 2 mm dia
7-624-102-01
retaining ring, 1.5 mm dia
7-624-102-01
retaining ring, 1.5 mm dia
3-701-437-01
washer, nylon; 2 mm dia
3-509-153-00
gear, worm
X-35090-24-0
pulley ass'y, friction
3-509-126-00
spring, tension
3-507-106-00
gear, worm
3-507-050-00
pin, connection
7-624-102-01
retaining ring, 1.5 mm dia
3-701-437-01
washer, nylon; 2 mm dia
3-507-049-00
lever (A), drive
3-509-127-00
spring, tension
X-35090-21-0
subchassis ass'y, shut-off
3-701-437-01
washer, nylon; 2 mm dia
3-509-100-00
lever (B), shut-off
3-701-437-01
washer, nylon; 2 mm dia
7-623-207-22
washer, spring; 2.6 mm dia
3-507-107-00
pulley (A)
7-621-259-25
P 2.6 x 4
7-621-710-30
set-screw, ⊖ 2 x 4
7-623-207-22
washer, spring; 2.6 mm dia
7-621-259-25
P 2.6 x 4

(3)



Note: • 1 ~ 8 Fast forward idler ass'y (X-35090-17-0) includes all the parts marked •.

(4)



Note: ▲1 ~ 7 Complete take-up reel spindle ass'y (X-35090-14-0) includes all the parts marked ▲.

※1 ~ 3 Main chassis ass'y (X-35327-01-0) includes all the parts marked *.

※3 X-35090-04-0 shaft ass'y, supply reel spindle

SECTION 7
ELECTRICAL PARTS LIST

Ref. No.	Part No.	Description
	COMPLETE CIRCUIT BOARDS	
	8-982-724-26	REC/PB amplifier
	8-982-724-27	intermediary
	SEMICONDUCTORS	
D101(D201)		diode 10D-05
D102(D202)		diode 10D-05
D103		diode 10D-05
Q101(Q201)		transistor 2SC632A
Q102(Q202)		transistor 2SC632A
Q103(Q203)		transistor 2SC634A
Q104(Q204)		transistor 2SC634A
Q105(Q205)		transistor 2SC634A
Q106		transistor 2SC634A
Q301		transistor 2SC634A
	INDUCTORS	
L101(L201)	1-407-212-00	inductor, micro 33 mH
L102(L202)	1-407-157-00	inductor, micro 10 μH
	1-464-005-00	osc unit

CAPACITORS

All capacitance values are in μF except as indicated with p, which means μμF.

C101(C201)	1-105-663-12	0.0015	±10 %	50 V	mylar
C102	1-121-402-11	33		10 V	electrolytic
C103(C203)	1-121-392-11	3.3		25 V	electrolytic
C104		----------			
C105(C205)	1-105-661-12	0.001	±10 %	50 V	mylar
C106(C206)	1-121-469-11	10		10 V	electrolytic
C107(C207)	1-101-881-11	47 p	±10 %	50 V	ceramic
C108(C208)	1-121-409-11	47		16 V	electrolytic
C109(C209)	1-121-469-11	10		10 V	electrolytic
C110(C210)	1-121-469-11	10		10 V	electrolytic
C111(C211)	1-105-677-12	0.022	±10 %	50 V	mylar
C112(C212)	1-121-392-11	3.3		25 V	electrolytic
C113	1-121-403-11	33		16 V	electrolytic
C114(C214)	1-105-673-12	0.01	±10 %	50 V	mylar
C115(C215)	1-102-975-11	100 p	±10 %	50 V	ceramic
C116(C216)	1-121-409-11	47		16 V	electrolytic
C117(C217)	1-121-392-11	3.3		25 V	electrolytic
C118(C218)	1-121-726-11	0.47		50 V	electrolytic
C119(C219)	1-121-391-11	1		50 V	electrolytic
C120(C220)	1-105-663-12	0.0015	±10 %	50 V	mylar
C121(C221)	1-102-815-11	110 p	±10 %	50 V	ceramic
C122(C222)	1-102-810-11	8 p	±1 pF	50 V	ceramic
C123(C223)	1-102-954-11	10 p	±10 %	50 V	ceramic
C124(C224)	1-102-956-11	15 p	±10 %	50 V	ceramic
C301	1-121-480-11	22		25 V	electrolytic
C302	1-121-414-11	100		10 V	electrolytic
C303		----------			
C304	1-121-733-11	470		25 V	electrolytic
C305	1-121-416-11	100		25 V	electrolytic
C306	1-121-733-11	470		25 V	electrolytic
C307	1-108-411-12	0.0015		200 V	mylar
C308	1-107-200-11	430 p	±10 %	500 V	silvered mica
C309	1-107-006-11	330 p	±10 %	500 V	silvered mica

RESISTORS

All resistance values are in Ω, ±5 %, ¼ W and carbon type unless otherwise indicated.

R101(R201)	1-242-721-11	100 k	
R102(R202)	1-242-671-11	820	
R103(R203)	1-242-681-11	2.2 k	
R104(R204)	1-242-699-09	12 k	low-noise
R105(R205)	1-242-685-11	3.3 k	
R106(R206)	1-242-705-09	22 k	low-noise
R107(R207)	1-242-637-11	33	
R108(R208)	1-242-681-11	2.2 k	
R109(R209)	1-242-677-11	1.5 k	
R110(R210)	1-242-709-11	33 k	
R111(R211)	1-242-691-11	5.6 k	
R112(R212)	1-242-719-11	82 k	
R113(R213)	1-242-708-11	30 k	
R114	1-242-663-11	390	
R115(R215)	1-242-725-11	150 k	
R116(R216)	1-242-697-11	10 k	
R117(R217)	1-242-689-11	4.7 k	
R118(R218)		----------	
R119(R219)	1-242-697-11	10 k	
R120(R220)	1-242-697-11	10 k	
R121(R221)	1-242-734-11	360 k	
R122(R222)	1-242-659-11	270	
R123(R223)	1-242-660-11	300	
R124(224)	1-242-705-11	22 k	
R125(R225)	1-242-665-11	470	
R126(R226)	1-242-665-11	470	
R127(R227)	1-242-709-11	33 k	
R128(R228)	1-242-709-11	33 k	
R129(R229)	1-242-705-11	22 k	
R301	1-242-697-11	10 k	
R302	1-202-557-31	220	½ W composition
R303	1-202-563-11	390	½ W composition
R304	1-202-557-11	220	½ W composition
R305	1-242-639-11	39	

Ref. No.	*Part No.*	*Description*
R306	1-242-649-11	100
R307	1-242-703-11	18 k
R903	1-244-673-11	1 k
R904	1-244-713-11	47 k
R907	1-244-673-11	1 k
R908	1-244-713-11	47 k
R909	1-202-557-11	220 ½ W composition
R910	1-202-553-11	150 ½ W composition
RV202	1-222-771-00	1 k (B), adjustable (PLAYBACK LEVEL)
RV301	1-222-775-00	22 k (B), adjustable (AGC BALANCE)

SWITCHES

S6	1-514-346-00	leaf, record
S7	1-514-986-00	leaf, muting
S8	1-514-533-00	micro, motor
S9	1-514-459-00	slide, BIAS SELECTOR
S11, 21	1-514-254-00	slide, REC/PB

MISCELLANEOUS

EH	8-825-506-00	head, erase (EF135-36)
R.P.H	8-829-236-20	head, REC/PB (PP128-3602)
	8-834-015-01	motor, cassette (D-015G)
J101(J201)	1-507-251-00	jack, mini
PL5	1-518-129-61	lamp, REC 4.5 V/40 mA
PL6	1-518-157-71	lamp, cassette indication
CNJ-9	1-508-491-00	connector, 3-p; male
CNJ-7	1-508-525-00	connector, 4-p; male
CNJ-3	1-508-529-00	connector, 5-p; male
CNP-9	1-509-466-00	connector, 3-p; female
	1-509-514-00	connector, 4-p; female
	1-509-515-00	connector, 5-p; female

SPEAKER SYSTEM

SS-170A

1. SPECIFICATIONS

System:	2-way
Speakers:	Woofer: 16 cm ($6\frac{1}{2}$"), cone Tweeter: 5 cm (2"), cone
Overall frequency response:	100 Hz to 20 kHz
Crossover frequency:	10 kHz
Maximum power handling capacity:	10 watts (music)
Dimensions:	225 (w) x 380 (h) x 130 (d) mm $8\frac{3}{4}$ (w) x $14^{31}/_{32}$ (h) x $5\frac{1}{8}$ (d) inches
Net weight:	2.5 kg (5 lb 8 oz) each

2. BACK COVER REMOVAL

The back cover can be removed by taking out the seven wood screws shown in Fig. 2-1.

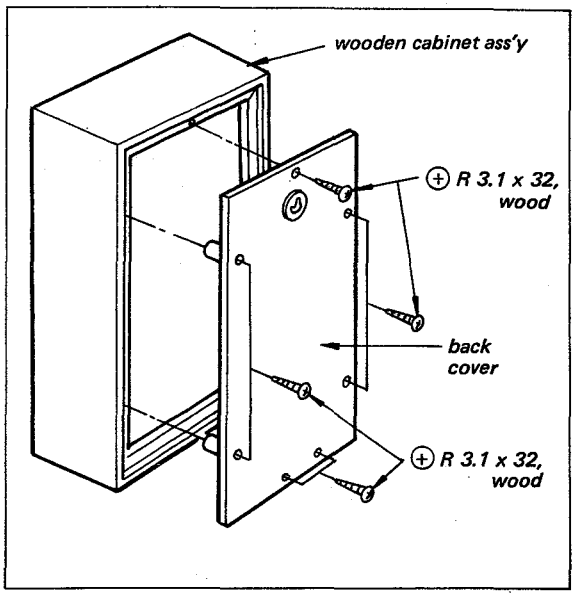
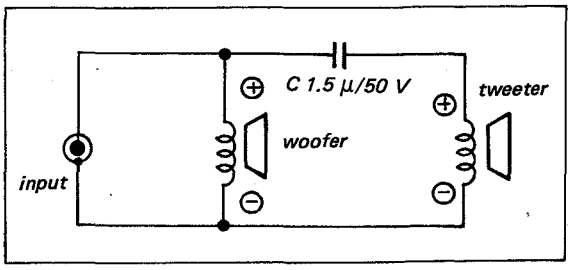
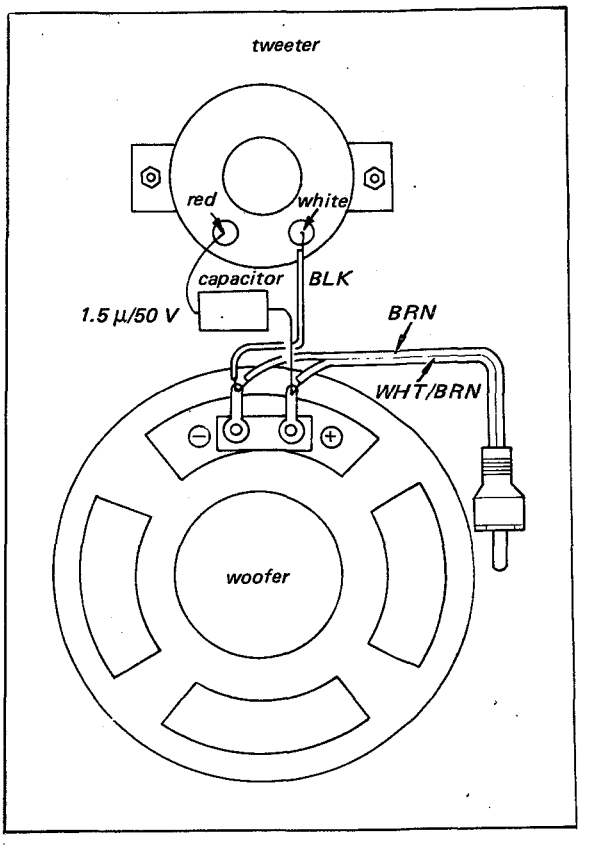


Fig. 2-1. Back cover removal

3. SCHEMATIC DIAGRAM



4. WIRING DIAGRAM



SONY®

SERVICE MANUAL

SPEAKER SYSTEM

SS-170A

1. SPECIFICATIONS

System:	2-way
Speakers:	Woofer: 16 cm ($6\frac{1}{2}$"), cone Tweeter: 5 cm (2"), cone
Overall frequency response:	100 Hz to 20 kHz
Crossover frequency:	10 kHz
Maximum power handling capacity:	10 watts (music)
Dimensions:	225 (w) x 380 (h) x 130 (d) mm $8\frac{3}{4}$ (w) x $14^{3}\frac{1}{32}$ (h) x $5\frac{1}{8}$ (d) inches
Net weight:	2.5 kg (5 lb 8 oz) each

2. BACK COVER REMOVAL

The back cover can be removed by taking out the seven wood screws shown in Fig. 2-1.

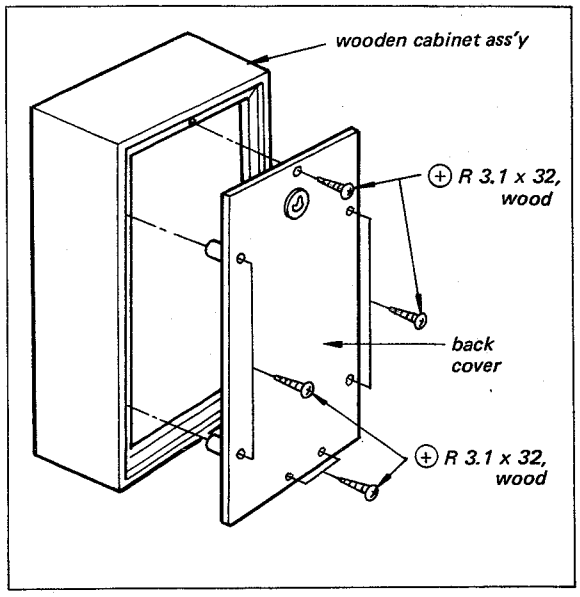
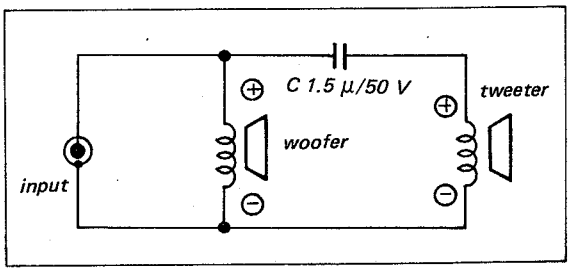
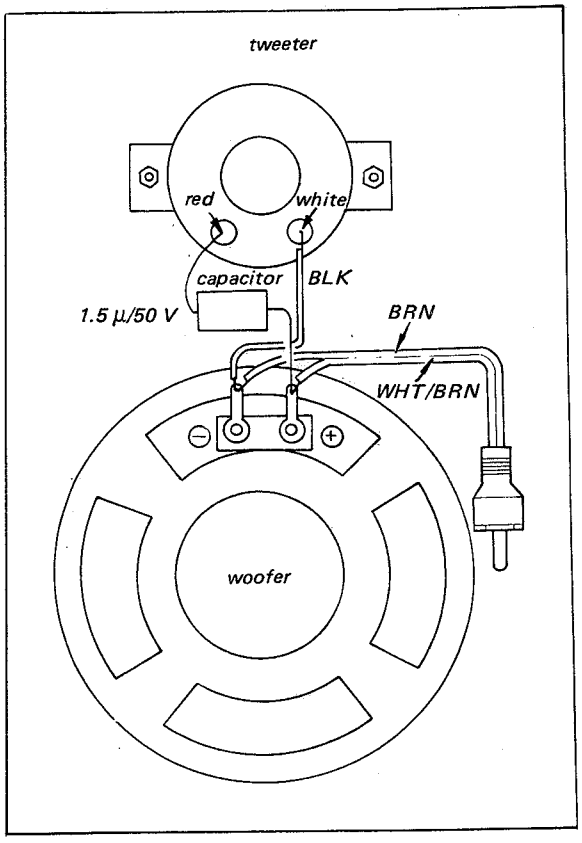


Fig. 2-1. Back cover removal

3. SCHEMATIC DIAGRAM



4. WIRING DIAGRAM



SONY®

SERVICE MANUAL

INFORMATIONS REGARDING THE CHANGE OF SERVICING MOTOR

THE SERVICING MOTORS DNM-1202A HAVE BEEN CHANGED TO NEW MOTOR DNM-5200A AS FOLLOWS:

NAME	FORMER PARTS
MOTOR DNM-1202A D-015	8-834-015-02 8-834-015-01

→

NAME	NEW PARTS
MOTOR DNM-5200A	8-835-068-01

NOTE: WHEN DNM-5200A INSTALL MODEL AS FOLLOWING CHART, PLEASE REPLACE TO THE PARTS WHICH DESCRIBED IN THE CHART.

MODEL	REPLACEABLE PARTS		
	NEW PULLEY	NEW SCREW	MOTOR PULLEY FOR SPEED ADJUSTMENT
TC-K7,K7II TC-K8B TC-229SD	3-551-167-00	7-621-972-05 PS 2.6×4	NONE
TC-2050D HMK-70 TC-131SD	3-533-439-21		3-533-439-21,-01,-11, -41,-51 (MIDDLE SPEED -21)
HP-169	3-703-549-05	7-621-972-25 PS 2.6×6	3-703-549-01 to 09 (MIDDLE SPEED -05)
HP-179,279 TC-3100 TC-10	3-509-156-21	7-621-972-25 PS 2.6×6	3-509-156-01,-11,-21 -31,-41,-51,-61 (MIDDLE SPEED -21)

9-919-470-00

SERVICE BULLETIN

Date	Ref. N°	Model
30 NOV 1981	GEN-01181	GENERAL AUDIO

Subject: Motor replacement
Remplacement de moteur
Austauschmotor

English :

The motor DNM-1202A has been replaced by the DNM-5200A.

Français :

Le moteur DNM-1202A a été remplacé par le DNM-5200A.

Deutsch :

Motor DNM-1202A wurde gegen DNM-5200A ausgetauscht.

old/ancien/alt		new/nouveau/neu	
DNM-1202A D-015	8-834-015-02 8-834-015-01	DNM-5200A	8-835-068-01

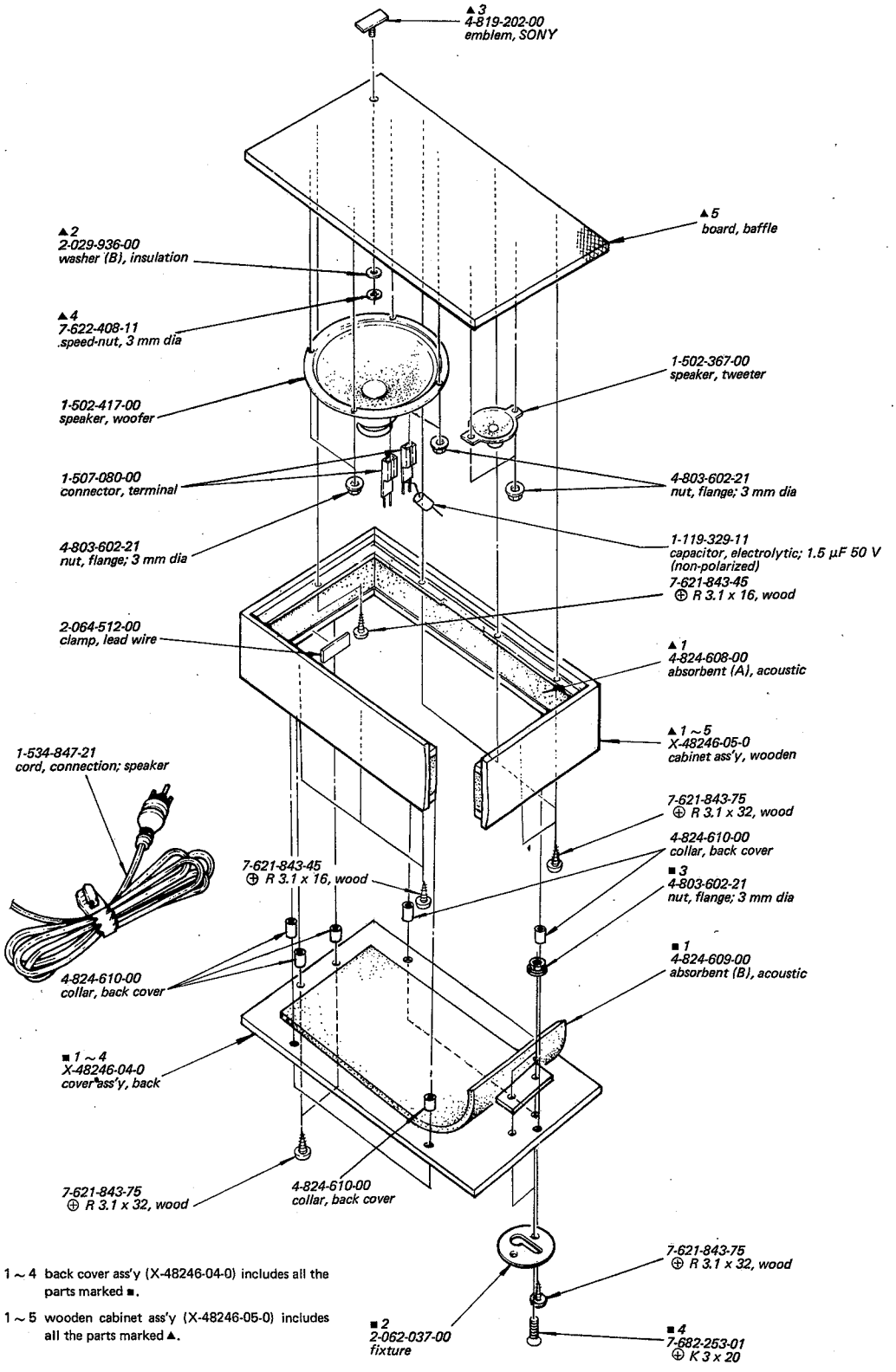
Install the DNM-5200A in accordance with the following table :

Montez le DNM-5200A conformément au tableau suivant :

Den DNM-5200A entsprechend der folgenden Tabelle einbauen :

	Parts to be replaced/Pièces à remplacer/Auszutauschende Teile		
Model Modèle Modell	Pulley Poulie Rolle	Screw Vis Schraube	Motor pulley for speed adjustment Poulie de moteur pour le réglage de la vitesse Motorrolle für Geschwindigkeitseinstellung
TC-K7,K7II TC-K8B TC-229SD	3-551-167-00	7-628-253-95 PS 2.6 x 4	NONE
C-2050D MK-70 C-131SD	3-533-439-21		3-533-439-21 standard -01 lower medium -11 ↓ -41 -51 higher
HP-169	3-703-549-05	PS 2.6 x 6	3-703-549-05 standard -01 lower medium ↓ -09 higher
HP-179,279 TC-3100 TC-10	3-509-156-21	7-628-254-17 PS 2.6 x 6	3-509-156-21 standard -01 lower medium -11 -31 ↓ -41 -51 higher

5. EXPLODED VIEW

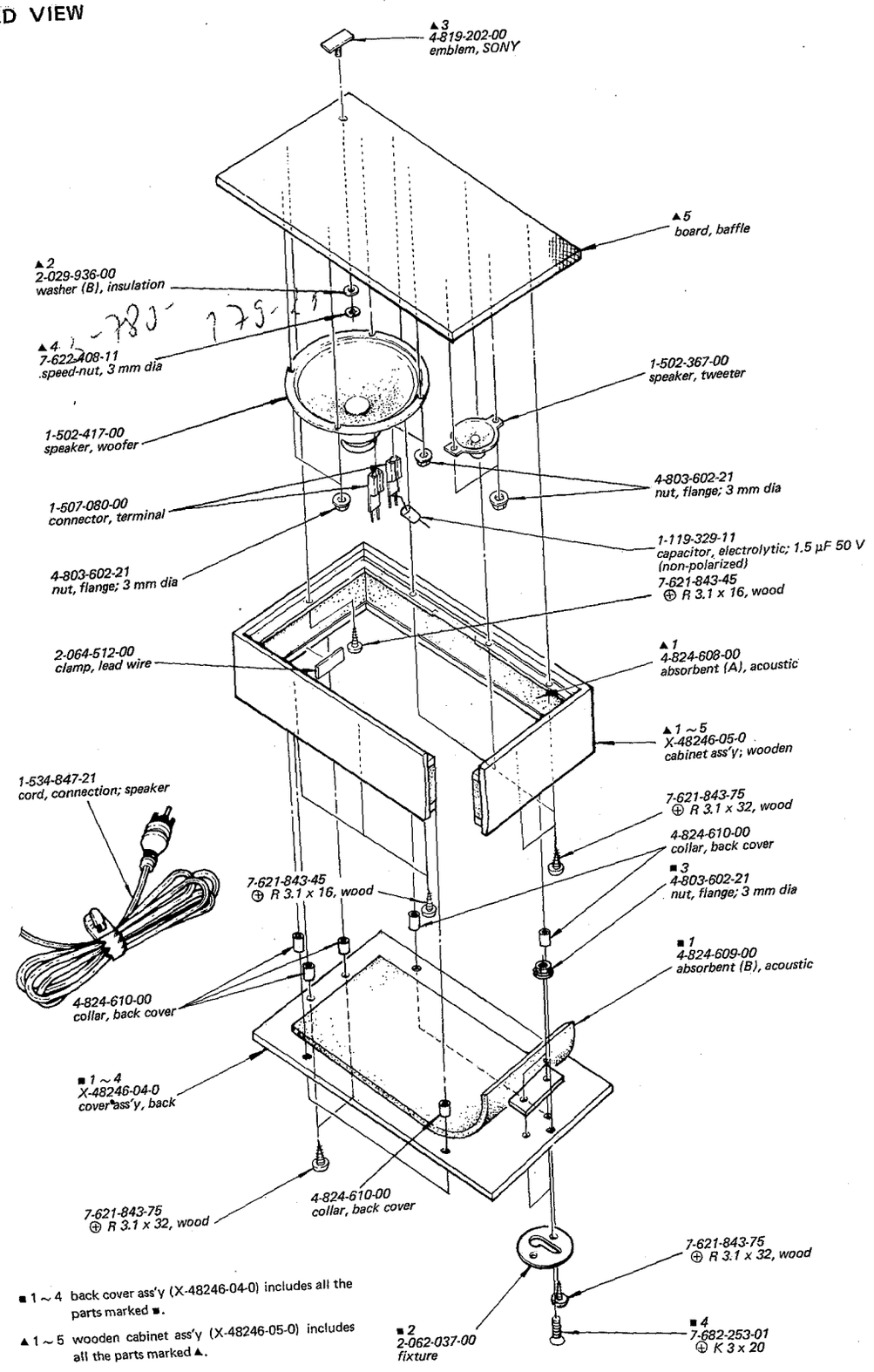


Note: ■ 1 ~ 4 back cover ass'y (X-48246-04-0) includes all the parts marked ■.

▲ 1 ~ 5 wooden cabinet ass'y (X-48246-05-0) includes all the parts marked ▲.

© 1973

5. EXPLODED VIEW



Note: ■1 ~ 4 back cover ass'y (X-48246-04-0) includes all the parts marked ■.

▲1 ~ 5 wooden cabinet ass'y (X-48246-05-0) includes all the parts marked ▲.

SONY CORPORATION

© 1973

Printed in Japan

3B0559-1